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CARCINOMA OF THE STOMACH

BY

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In spite of the general progress of surgery carcinoma of the stomach still remains one of the greatest of human tragedies. It occurs so often that it concerns us all, in whatever branch of medicine we may be working. In England approximately 15,000 people die of it annually—that is, about forty a day—while in the United States of America the number is approximately 38,000. Of all varieties of carcinomata it is one of the commonest, sharing this position with carcinoma of the breast and uterus. In men it forms about one-fourth of all varieties, and in women about one-sixth. In the surgery of the abdomen it accounts for approximately one-quarter of all operations upon the stomach.

Only too often it slowly and insidiously attacks those who have apparently been in perfect health, and it occurs at an age when its sufferers are looking forward to and preparing for a peaceful and happy enjoyment of their retiring years. The progress of its treatment has not kept pace with that of other gastric lesions, and only too often its recognition is the harbinger of a rapid and miserable end. Yet, as I shall hope to show you, some progress has been made and radical treatment has restored many hopeless sufferers to healthy and happy people.

Incidence

It has often been stated that the disease is on the increase, but of this I am doubtful. Owing to the more careful and complete methods of investigation fewer cases are overlooked, and with an increase of the total population, and especially with an increase of those who reach the cancer age, more cases are certain to occur; but in my own series of 572 patients there has been an average of thirty new cases per annum during the past ten years. The condition is most frequently seen between the ages of 50 and 60, but a large number occur in the decades immediately above and below this, and, as shown in Table I,

TABLE I.—*Age Incidence*

Years	No.	Years	No.
20–29	5	60–69	163
30–39	51	70–79	20
40–49	113	80–89	1
50–59	219	Total	572

may even be found between the ages of 20 and 30, and over 80. Cramer has found that the incidence steadily increases with age, and that the infrequency in the later periods of life is solely due to the fact that there are fewer people of advanced age.

The male sex is more often attacked than the female. In my own series there were 398 males and 174 females—that is, 69.5 per cent. males—a preponderance which is rather less than that seen with peptic ulcers, where in a total of 2,143 cases there were 1,654 males and 489 females. It used to be generally believed that the majority of cases were primary and occurred in stomachs which were previously healthy, there being relatively few that were recognized as being dependent upon some previous organic lesion. These few are, however, of very considerable importance, for I know of nothing more depressing than to operate upon an irremovable carcinoma of the stomach which has followed a benign lesion of many years' standing, and to realize that if only adequate surgical treatment had been performed earlier the carcinoma would have been prevented. I cannot help feeling that the modern fashion of treating all peptic ulcers medically has led to many carcinomata being overlooked by those who have not had enough experience to make the differential diagnosis.

A small percentage are undoubtedly secondary to adenomata. These benign lesions are relatively uncommon and often do not produce symptoms. In my own series only six cases were found in over 3,000 operations upon the stomach. Stewart in his post-mortem investigation found about one in 200 necropsies. Of the 572 carcinomata in my series twenty-seven were accepted as having started in adenomata or were associated with them. Occasionally a severe haematemesis may have occurred in the past history, but as a rule this variety is insidious in its onset. The importance of their recognition lies in the fact that they may give rise to a very massive carcinoma situated on the greater curve of the stomach, which may cause a big palpable tumour that is considered to be inoperable. The condition, however, appears to be relatively benign, for at operation it may be found to be quite movable and to have led only to secondary deposits in the local glands. For this reason it is my custom never to regard a case as inoperable simply because of the size of the tumour.

Relation of Carcinoma to Gastric Ulcer

The question whether carcinomata may be secondary to a previous gastric ulcer has in the past led to a great deal of discussion, and even to-day there is no unanimity of opinion as to its frequency. The majority of workers, however, accept Stewart's figures as being approximately correct, and my own experience very largely agrees with his. He finds that about 9.5 per cent. of ulcers become carcinomatous; but this change is likely to occur in one in four of ulcers situated in the prepyloric area. About 17 per cent. of the carcinomata start in an ulcer. It is my own custom to exercise a very strict supervision over the classification of the types of carcinoma, and only to accept as starting in a previous ulcer those cases which fulfil the following four requirements: They must have had a history suggestive of a past ulcer; the test meal must show the presence of free hydrochloric acid, often above the normal; at operation the lesion must simulate a chronic ulcer; and the microscopical report must indicate that this was the nature and origin of the growth. With these criteria sixty-one of my 572 cases

are grouped as having arisen in an ulcer—that is, 10.5 per cent. This is rather less than Stewart's 17 per cent., but of course it does not include any of the cases that are already inoperable, for in this group the pathological proof cannot be obtained. It is on this question of the pathological appearances that probably the greater number of the disagreements have arisen. For a case to be accepted the four pathological points which Newcomb has stressed should be present. They are: a complete destruction of the muscle in the base of the ulcer, the presence of much fibrosis in and around the base, the presence of surrounding endarteritis, and a fusion of the muscularis and muscle coats at the edge of the ulcer. Whatever be the exact frequency is not of practical importance, provided we all recognize the fact that an ulcer may become malignant, and that many cases of carcinoma may in their early stages give a history suggestive of an ulcer. For this latter reason the percentage of those cases primarily diagnosed as ulcers which later become malignant is higher than the figures I have already given. In my own series 112 of the cases gave an early history which suggested a chronic gastric ulcer, and I am sorry to say that in a considerable number of these medical treatment had been persisted in for so long that when the patient sought my advice the condition was already inoperable. It is in this group, relatively small though it is, that I feel progress can be made by a more careful attention to the clinical details and a recognition of those points which are suggestive of the presence of carcinoma. In this consideration an interesting point is the relation of carcinoma to the scars of healed ulcers, and, to us surgeons more especially, the relation to the scars of ulcers which have been healed by previous operation. If such a relation was relatively common it would be a strong argument in favour of the more routine use of radical operations in the treatment of peptic ulceration. My own series throws interesting light on this point. There were in all twenty-three cases which had followed a previous operation for ulcer (Table II). In four of

TABLE II.—*Carcinoma after Operations for Ulcer*

Shortly after	.. ..	4
Remote from ulcer	..	9 (4, 7, 7, 7, 14, 15, 17, 23, 25 years after)
Later in ulcer site	..	10 (3, 5, 5, 6, 6, 12, 14, 15, 21, 29 years after)

these the ulcer was so big that a palliative operation had alone been performed, and the carcinoma followed shortly afterwards. There can be no doubt that in them the condition was already carcinomatous at the time of operation. The error was of course of no importance, for the ulcer was inoperable and would have remained so even if it had been known to be carcinomatous. In the second group (nine cases) the carcinoma occurred in some portion of the stomach remote from the site of the previous ulcer, and did not take place until many years afterwards. It is manifest that these cases had nothing to do with the primary lesion, and although it is true that a partial gastrectomy might have prevented the onset of carcinoma, this would have been no more justifiable an argument in favour of its employment than it would be to suggest that such an operation should be performed in normal people in order to prevent them getting carcinoma later on. The third group is that in which carcinoma occurred at the site of the ulcer many years afterwards, and probably could have been prevented if the ulcer had been excised at the time of the first operation. There were ten such cases in my own series.

Probably one of the greatest advances in our knowledge of the aetiology of this disease lies in the recent conclusions of Sir Arthur Hurst. His investigations have produced very strong evidence to show that the cases which were previously regarded as primary are dependent upon a gastritis. He believes that the achlorhydria is caused by the gastritis and is not due to the growth, for he found that in every case of undoubted ulcer-cancer free hydrochloric acid was present; and when there was no evidence of such a previous ulcer the acid was usually absent, even in very early stages of the disease. He states that he has in his own series five cases in which the achlorhydria was present before the carcinoma developed, and that he has found record of twenty-two similar reported cases. He does not believe the acid falls after the onset of the growth. This latter point is of very considerable interest. I had previously believed that with the onset of carcinoma a gastritis might be set up and the acid diminish, but in my own series, in which test meals had been taken previously and had shown a fall with the onset of carcinoma, a gastro-enterostomy had been performed, and therefore these observations were of little value. It is true that Comfort has investigated a series of cases at the Mayo Clinic in which he seems to show that the acidity falls with the progress of the carcinoma, and that cases have been reported by Robertson and Wilkinson where there appeared to be a definite fall in the acidity in test meals taken before and after the onset of the carcinoma. The evidence which Hurst produces, however, is very strong, and he concludes that carcinoma never develops in a healthy stomach; but if a patient with a constitution predisposing to carcinoma also has achlorhydria and gastritis he will probably develop carcinoma, and Hurst holds out a strong hope that the early recognition and treatment of the gastritis may do much to diminish the frequency of carcinoma. He lays stress upon the interesting fact that although the incidence of carcinoma is much the same in all countries, yet in England only 22 per cent. of the cases occur in the stomach, whereas in Holland this percentage is 55. He believes that this difference is due to the greater incidence of gastritis in the latter country.

If the achlorhydria is the primary factor then we should expect to see cases of carcinoma occurring in patients who had had pernicious anaemia. It is of course only in recent years that the sufferers from this disease have been kept alive long enough for such a possibility to occur. Sir Arthur Hurst states that he has seen six cases of carcinoma of the stomach with pernicious anaemia, and that he has knowledge of twenty-four others which have been reported. In two cases he has seen the development of carcinoma after the pernicious anaemia had been cured. In my own series there have occurred two cases with pernicious anaemia. In one the anaemia arose seventeen years after an operation for gastric ulcer, and two years later carcinoma occurred. In the second case the patient had had pernicious anaemia in 1927, which had been treated and apparently cured, and in 1930 developed a carcinoma of the stomach.

It would be of little practical value in this discussion to consider in detail the pathological types of carcinomata which may be found in the stomach; but I may point out that the rare cases of sarcoma and lymphogranuloma, four examples of which occurred in my series, are clinically indistinguishable from carcinomata.

Symptoms

The main difficulty in the successful treatment of carcinoma of the stomach is that nearly two-thirds of the patients only seek surgical help after their disease has become inoperable. I wish I could say that this was due

to the fact that errors of diagnosis had been made in the earlier period, for then one could hope that with a wider recognition of the symptoms more cases would be cured; but unfortunately in many the symptoms may have been present for only two or three weeks, but the condition is already inoperable when advice is first sought. There are, however, still some cases where the symptoms, in the earlier stages, are so indefinite or may so resemble a non-malignant tumour that they are overlooked for too long and are treated medically. It is these cases that we can hope to save by earlier surgical treatment. I am still confident that, even with the modern methods of investigation in use to-day, the greatest certainty of diagnosis lies in a careful investigation of the clinical history, and that sometimes indeed the more modern methods may lead one astray after a correct primary diagnosis has been made. The first point of importance, which has been so often stressed before but which cannot be too often reiterated, is that a gastric ulcer practically never starts after the age of 40, and that if a patient over the age of 40 with a clear past history comes up complaining of dyspepsia he *has* got a carcinoma of the stomach unless the contrary can be definitely proved. Moynihan's clinical classification is still of the greatest value. He pointed out that these cases may appear in three separate groups—namely, carcinoma of the cardiac orifice, of the pyloric orifice, and of the body—and that the latter, which is the biggest group, shows three methods of origin: those with a sudden onset, those with an insidious beginning, and those which are secondary to a peptic ulcer. The frequency of these types in my own series is shown in Table III.

TABLE III.—*Clinical Types*

Pyloric obstruction		216
Cardiac obstruction		46
Body: Sudden onset	23	
Insidious	15	310
Secondary to ulcer	112	
Total		572

It is well to remember that carcinoma of the cardiac or pyloric orifice will generally lead to obstruction, and that in either case the symptoms of the obstruction entirely mask the underlying cause. A patient with a carcinoma of the cardiac orifice will begin to develop symptoms of difficulty in swallowing. The history will usually be short and steadily progressive, the obstruction being marked at first only for solid food, but later increasing until there is difficulty even in the passage of fluids. Such cases do not as a rule cause much perplexity, for it is universally recognized that a rapidly increasing difficulty in swallowing in a patient over the age of 40 is generally due to a carcinoma either of the oesophagus itself or of the cardiac orifice of the stomach. Their recognition is, however, becoming of greater importance, for not only are they relatively common—in my own series there were forty-six cases at the cardiac orifice over and above the true cases of carcinoma of the oesophagus—but operations upon this type of growth, aiming at its radical removal, although at present tentative and somewhat experimental, are beginning to be more and more successful and are giving us hope that the intrathoracic or the combined abdomino-thoracic operation may lead to the cure of a considerable number of these unfortunate sufferers.

PYLORIC OBSTRUCTION

When leading to pyloric obstruction the individual symptoms of the obstruction are indistinguishable from those caused by a stenosing ulcer or by involvement of the pylorus from some lesion without, such as a chronic cholecystitis, chronic pancreatitis, or carcinoma of the head of the pancreas; but here again a careful consideration of past history should prevent the possibility of error. The short and steadily progressive history is the factor of chief import, and it must always be remembered that the onset of pyloric obstruction in a patient over the age of 40 is due to a mechanical cause, and must be treated by early operation. In the early stages the patient chiefly complains of a feeling of discomfort and distension, which increases as the day goes on, and is soon associated with a loss of appetite and with occasional vomiting. As the disease progresses the vomiting becomes more marked and takes on the projectile character. The vomit itself becomes large, generally occurs in the evening when the stomach has been filled, and the emptying of the stomach gives very considerable relief. The physical signs are often definite, and three stages of obstruction can be recognized. In the first the stomach is dilated and atonic, the atony being shown by the presence of splashing over the stomach. This may be obtained on physical examination, or the patient himself may complain of it during movements. The evidence of the dilatation can be heard but not seen or felt. As the condition progresses the stomach undergoes a certain amount of hypertrophy, and tends to contract upon the large mass of its contents. On physical examination its outline may generally be felt as a distended bag. Later still the hypertrophy is accompanied by peristaltic waves, which may be so forcible that they are readily visible through the abdominal wall, and the outline of movements of the stomach can then be seen. Such a degree of obstruction may be associated with a considerable amount of gastritis, and thus an absence of free HCl may be found in the test meal even if the obstruction is not carcinomatous; but in my own experience the fall in acid is never so early and never so marked with the benign lesions as with the carcinomata. An *x*-ray investigation may again disclose only the pyloric obstruction, for the barium meal may be unable to pass into the pyloric canal, and thus will not show the irregularity and filling defects due to the growth. In other words, all the methods of investigation will reveal only the presence of a pyloric obstruction, and will not indicate its nature. This will be indicated solely by the age of the patient, the shortness of the history, and the progressiveness of his symptoms.

SYMPTOMS IN THE BODY OF THE STOMACH

When the lesion is in the body of the stomach the symptoms may arise with a suddenness of onset which is very deceiving. Fortunately such cases are rare. In my own series there were twenty-nine examples. A few may occur with a perforation, but these are so rare that they are of little practical importance. In my series there were only two. Sometimes the onset is with a large haematemesis, and I have known several such patients who after the collapse from the haemorrhage had been treated for many weeks or months for a supposed ulcer, until the carcinoma was hopelessly inoperable. If it had only been realized that even a haematemesis occurring in a man over the age of 40 with a clear past history was most probably due to a carcinoma this mistake would have been avoided. The interesting variety is that in which a patient partakes of a meal which is perhaps for him of a rather unusual character. It is followed by a severe indigestion, which persists from that time, and when he seeks advice he will date the whole of the symptoms back to that one meal. The danger is that the condition may be regarded as one of food poisoning and the possibility of carcinoma be entirely overlooked. The fact that he has a constant gastric pain which is not relieved by

vomiting, that his appetite is completely lost, and that he has no diarrhoea should arouse suspicion. If he is fortunate his vomit may contain a small amount of blood, and the underlying nature of the lesion be suspected early. Even if this does not occur an investigation of the vomit will generally show the presence of occult blood. A test meal will reveal the absence of free HCl, and the radiograph will generally show a filling defect.

The greater number in this group have a slow and insidious onset, and it is this variety which may be regarded as giving the most characteristic evidence of carcinoma of the stomach. The symptoms are variable. At times they are entirely extragastric, and the man may seek advice not for his indigestion but because he is cognizant of an increasing weakness and loss of energy. When questioned he will usually admit that he also has a loss of appetite and that he has a certain amount of discomfort after his food. From the time of the onset his symptoms are steadily progressive; his appetite will decrease, his discomfort after food may become more severe and is always continuous, so that although it may be made worse by the taking of food it does not entirely disappear before the next meal. At the same time he may complain of the eructation of foul gas or of quantities of foul and bitter fluid. Later true vomiting is added, but it does not give complete relief to the pain. There is often a visible anaemia, and loss of weight, although by no means characteristic, may be present. The persistence of such symptoms for two or three weeks should at once arouse the suspicion of carcinoma, and an investigation should be carried out. Visible blood may be present in the vomit or stools, but even if this is absent it will nearly always be found on chemical examination. I feel that here one ought to issue a word of warning. If occult blood is found in the stools it is often the custom to treat a patient medically for a supposed ulcer, and only to consider the question of carcinoma if the occult blood fails to disappear. This is a loss of very valuable time, and medical treatment should only be persisted in if there is strong positive evidence, either in the past history or in the other methods of investigation, of the presence of a gastric ulcer. If the history is suggestive of carcinoma it should not be continued. In many such cases the *x*-ray investigation will give positive evidence of the presence of carcinoma; unfortunately, indeed, it may in some cases give evidence that the growth is already past surgical treatment. On the other hand, in very early cases the evidence obtained by these means of investigation may be indefinite. In such cases gastroscopy may be of value. The blood should be investigated: a low haemoglobin content is not only suggestive but may have to be corrected before operation is considered.

GROWTH SECONDARY TO GASTRIC ULCER

Even in that type of growth which occurs secondarily to a gastric ulcer a consideration of the symptoms is of very great value. My own experience has been that a positive diagnosis can often be made by a consideration of the history of the clinical symptoms, even when an investigation by the *x* rays and the gastroscope is still uncertain. It is important to realize this—for, as I have already pointed out, there were in my own series 112 cases which presented the symptoms of a past gastric ulcer—and to remember that ulcers in the pyloric antrum are specially prone to become malignant. The changes first to be looked for are in the nature of the periodicity. The patient will so often himself state that the last attack is different from the previous ones: it is longer and the symptoms may be different; the pain is more continuous throughout the day, has not the same close relation to the ingestion of food, is less severe but more continuous. He will note that whereas in previous attacks his appetite has remained good, in this attack it has begun to fail, and it is an interesting thing to note that this may be quite definite, although he still has a high acid content in the test meal. Vomiting often becomes rather more frequent, although the vomits are small; but if it was present in the previous attacks the patient may note that whereas before it relieved his pain it has now ceased to do so. The presence of such a group of symptoms should at once raise the suspicion of the possibility of a carcinomatous change. Personally, I would regard them as a definite indication for operative treatment, and I should be but little inclined to waste further valuable time in making prolonged investigations of the stomach content and the stools or in *x*-ray or gastroscopic investigation.

In this variety, as in those with an insidious onset, a careful examination of the abdomen may reveal the presence of a tumour. Stress must here be laid on the fact that a careful inspection may often show a tumour which can be felt with difficulty, and that, generally speaking, the lighter the palpation of the abdomen the more will be felt within it.

ACCESSORY METHODS OF INVESTIGATION

Although the greatest reliance is to be placed upon the careful taking of the patient's history and upon his clinical investigation, there is no doubt that in difficult cases much help may be obtained by the accessory methods of investigation. The presence of occult blood in the stools and test meal is of very considerable importance, and there are many physicians who state that the persistence of occult blood is indicative of carcinoma. My only criticism of this is that if too much reliance is placed on this test alone valuable time may be wasted. The presence of achlorhydria is suggestive, but it may be found with a simple gastritis. A careful screening and *x*-ray examination is of the greatest value, but it must be undertaken by one who is skilled in this type of work. One or two simple films may be of absolutely no value, yet a careful screening and a careful investigation of the mucosal contours may show a minute lesion. Gastroscopy carried out by one skilled in its use may in a difficult case be of inestimable value, and this is especially so, I think, in those cases of gastric ulcer which are showing a very early carcinomatous change. By its use Mr. Hermon Taylor has enabled me to carry out radical operations in a few extremely early cases of carcinoma. Nevertheless I am frequently seeing cases reported in the literature where a positive diagnosis ought to have been made on the history, and valuable time has been lost in making several gastroscopic examinations.

Treatment

In considering the indications for surgical treatment one must ever remember that without such intervention the patient is condemned to death. In the present state of our knowledge there is no other measure which can be said to offer any hope, and although it is true that the majority of these patients are poor operative risks, and that any operation which hopes to be successful must be extensive, yet the majority will be only too willing to accept a chance, slender though it may be. My own practice is to advise operation in every case in which there is no evidence of secondary deposits. It is even a debatable point whether an operation should not be advised where there is a suspicion of only one secondary deposit. It may sometimes happen that a palliative removal of a primary growth,

even when there is such a secondary deposit, may give a prolonged period of comfort and happiness. Even in doubtful cases an operation should be advocated, for not only may very large tumours prove to be removable, but should removal be impossible it is a solace to the relations as well as to the patient himself to know that no chance of a cure had been missed. Unfortunately even to-day the percentage of cases in which a radical removal is possible is still relatively small. In my own series of 572 cases such a removal was possible in only 224—that is, a percentage of 39.1. In spite of the attention which is now given to this disease, I still feel that it should be possible to improve on this figure. I have already laid stress upon the fact that many patients are already in the inoperable stage when they first seek advice, but I still meet a considerable number of patients who have had medical treatment carried out for too long a period, either because the condition had been mistaken for an ulcer or because it had not been realized that there was an organic lesion of the stomach. It is probable that if an operation had been performed a few months earlier the disease might have been radically cured. In this respect, however, it is satisfactory to know that there has been a steady improvement. In my first seven years only 28 per cent. of the cases were removable. In the second seven years this had increased to 35 per cent., and in the third seven years to 44 per cent. It is of course possible that with increasing experience on my part I am attempting the removal in many patients whom in the earlier years I should have condemned as inoperable; but nevertheless I do feel that in large measure this progress is due to increasing care and skill on the part of the general practitioner. It is still probable, however, that the operability rate will be improved with a wider appreciation of the fact that any dyspepsia starting in a patient over the age of 40 is carcinomatous unless a rapid and full investigation has eliminated this possibility.

I do not propose to discuss the technical details of the operative steps. It will suffice to say that after the abdomen has been opened a rapid survey must be made to determine the presence of secondary deposits in the pelvis, in the glands, in the liver, and by local spread to the surrounding tissues. If the condition is favourable the resection of the stomach must be as wide as possible, and it must include all the lymphatics in the areas which drain the stomach. So wide a removal is bound to carry with it a relatively high mortality, especially as many of these patients are elderly and are already in a poor state of health. The majority of the published statistics show that the operative mortality is in the neighbourhood of 30 per cent., and in my own series it was only just below this figure. It is as well to remember, however, that any operation on these patients is bound to be serious. In my own series there were fifty-seven cases in which an anterior gastro-enterostomy to relieve obstruction was alone possible, yet this relatively simple operation was associated with a mortality of 42 per cent.; and even those cases in which the only resort was an exploratory laparotomy carried with them a mortality of nearly 18 per cent. As regards the operation of gastro-enterostomy, it is well to point out that this should only be performed if there is a definite pyloric obstruction. It will give little or no relief to a fungating growth in the body of the stomach, and the very high mortality is due to the fact that the patients are such bad operative risks. It is therefore not justifiable to undertake it unless the greater part of the symptoms are obstructive in nature. In lesions which are situated at the cardiac orifice, and are associated with a difficulty in swallowing, a gastrostomy is a justifiable and often a helpful procedure, but it is doubtful whether it should be performed in patients in the poorer classes of life, to whom feeding through a gastrostomy orifice becomes a difficult and even impossible procedure. In many cases a partial gastrectomy may be the best palliative procedure. Even if secondaries are present the removal of the large mass of fungating growth in the cavity of the stomach may make the patient's life much more comfortable, and he may be able to live in happiness for many months or in some cases for several years. At one time I was hopeful that the implantation of radium after opening the abdomen, and after the removal of the main mass of the growth, might diminish the possibility of recurrence. I found, however, that it added considerably to the risk of the operation, and was sometimes followed by the formation of duodenal fistula. I therefore feel that it is a procedure which is of very little value.

Results of Treatment

Compared with the results of carcinoma elsewhere those obtained in treatment of carcinoma of the stomach are very disappointing. This is mainly due to the fact that in any big series so large a proportion of the cases are inoperable; but even in those in which the growth can be taken away one has to be content, owing to the anatomy, with a more local removal than would satisfy us in many other forms of carcinomata. As a general rule the growth spreads chiefly along the lesser curvature of the stomach, which is so short that even in our widest removals we are often only an inch or less beyond the margin of the growth. Increasing technical knowledge has led to wider resections, and not only can the greater part of the stomach be taken away but the glands around the coeliac axis and elsewhere can be more widely removed, with a greater chance of a more successful issue. At the same time such operations are likely to increase the mortality, and therefore there arises the apparent paradox that the greater the surgeon's experience is the higher his mortality is likely to be. In my own early series the operative mortality for resection was 26 per cent., but in my later series it has risen to just below 30 per cent. Nevertheless I feel that it is the surgeon's duty to carry out a resection wherever it is possible, but the patient should be most carefully prepared for the operation. A blood transfusion may also be required, but in my experience it is only of value if the haemoglobin is reduced; so that a blood examination should always be regarded as a necessary investigation before operation is undertaken. Because of the small proportion of cases in which a radical operation is possible, and because of the high mortality, there are still many physicians who advise against operative treatment, but I feel this is a wrong view. With an operability rate of only 40 per cent. and a 30 per cent. mortality, it means that twenty-eight patients in every hundred will survive operation and will have a good chance of remaining free of their disease. It is surely better to give 28 per cent. a chance of life and happiness than to condemn the whole hundred to a slow and lingering death. It is to the actual end-results of operation, however, that we must look for its value.

It is one of the tragedies of this disease that one is unable to say with certainty that a patient is cured, as the recurrence may occur at very late periods after operation. In fact, one can only say that he has been cured of his carcinoma when he has died of some disease unconnected with his gastric lesion. It is usual, however, in evaluating late results, not to regard any patient as permanently cured, but to consider those who have survived for a five-year interval without any evidence of recurrence.

Many of my more recent patients have recovered from their operation and are at present in a state of good health, eating well and with no gastric symptoms; and it is possible that a considerable number of these may ultimately pass the five-year period. In my own series the patients who have been operated upon for five or more years number 422 (Table IV). In 150 (35.5 per cent.) a radical operation was possible. Of the total, 111, or 26.3 per cent., survived the operation, but of these 111 only twenty-seven have remained free from recurrence for over five years. This seems a very small proportion of the whole, and indeed one must admit that such results are extremely disappointing; but when one remembers that up to a few years ago a carcinoma of the stomach was regarded as an inevitably fatal disease one has to agree that some progress has been made. Of the 422 patients who sought relief 6.4 per cent. are as the result of surgical operation alive and well after five or more years. Of those in whom a resection was possible—namely, 150—18 per cent. are alive and well, and of those who survived a partial gastrectomy 24.3 per cent. are alive and well. This perhaps brings out more clearly than any other statement the importance of straining every effort to operate upon these cases in the early stage, for earlier operation gives us the one hope of raising the 6.4 per cent. to 24.3 per cent. If one keeps constantly in mind the fact that a dyspepsia arising in a man over the age of 40 is probably due to carcinoma, and that an ulcer in the prepyloric region of the stomach is very prone to become carcinomatous, it is probable that a large number will be operable and have a chance of being restored to complete health. The end-results of these cases are perhaps best shown in Table V, where it will be seen that patients are alive and well for 24, 23, and 21 years after operation. But even this table does not give a true indication of the length of cure, for some of the patients were elderly and have died of conditions not connected with their gastric lesion. Two, for instance, died respectively at ten and eleven years after operation from lesions quite distinct from carcinoma of the stomach.

TABLE IV.—*Results of Operation*

	Total	Resections	Operative Survivals
All cases	572	224 (39.1%)	143 (25%)
5 years or more	422	150 (35.5%)	111 (26.3%)

Late Results

	Alive and Well	% of All Cases	% of Resections	% of Operative Survivals
All cases	45	7.8	21	31.4
5 years or more ..	27	6.4	18	24.3

TABLE V.—*Survival Periods*

Years	No.	Years	No.
5	8	14	1
6	1	17	1
7	5	21	1
8	1	23	1
9	3	24	1
10	3		
11	1	Total	27

We must conclude, therefore, that although the outlook is still bad despite the results of surgical intervention, yet the figures are improving, and that cancer of the stomach, which is otherwise bound to be fatal, can in a certain number of cases be cured by surgical operation.

LYMPHATIC LEUKAEMIA

THE VALUE OF STERNAL PUNCTURE IN THE DIAGNOSIS OF ATYPICAL CASES

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In classical lymphatic leukaemia the blood picture shows diagnostic changes; a typical overwhelming lymphocytosis—50,000 to 500,000 white cells per c.mm., of which 90 per cent. or more are lymphocytes. The sternal marrow merely reflects these changes; it is very cellular, and 70 per cent. or more of the cells are lymphocytes. But often some of the clinical signs may be missing: Naegeli (1923) listed ten variations, and the lymphocytes of the blood may not be significantly increased. In these patients sternal puncture will often provide the clue to an otherwise open diagnosis. The following records give five examples of this type of case. Detailed figures of the blood and marrow counts are given in the table.

Table of Blood and Marrow Counts

Case No.:	I	II	III	IV	V
			Blood		
Red cells, millions per c.mm.	2.570	2.470	4.526	2.480	4.680
Haemoglobin, per cent...	56	45	93	54	84
Colour index	1.10	0.90	1.01	1.08	0.90
White cells, per c.mm. ..	11,500	6,800	9,800	3,200	12,400
Polymorphs, per cent. ..	8.0	34.0	17.5	30.0	19.5
Lymphocytes ,, ..	91.5	63.5	75.0	64.0	77.5
Monocytes ,, ..	0	2.5	7.0	5.5	2.0
Eosinophils ,, ..	0.5	0	0	0.5	1.0
Basophils ,, ..	0	0	0.5	0	0
			*Bone Marrow**		
Lymphocytes, per cent...	87.0	75.0	88.0	30.4	64.0
Lymphoblasts ,, ..	1.2	0.8	0	22.0	0
Polymorphs ,, ..	3.4	14.2	3.2	8.2	8.6
Metamyelocytes ,, ..	0.8	6.2	0.6	1.2	4.2
Myelocytes ,, ..	0.4	3.0	0.8	2.0	12.0
Normoblasts A ,, ..	0	0	0	2.6	0.4
,, B ,, ..	4.0	0.4	1.2	16.2	4.2
,, C ,, ..	3.2	0.4	1.4	11.8	4.2
Pro-erythroblasts ,, ..	0	0	0	0.6	0
Haemocytoblasts ,, ..	0	0	4.8	4.4	2.2
Plasma cells ,, ..	0	0	0	0	0.2
Monocytes ,, ..	0	0	0	0.6	0

* The nomenclature of the marrow cells is that adopted by Israëls (1939a).

Case I

A married woman aged 40 had noticed a swelling in the left side of her abdomen for three months. During the same period she complained of increasing weakness, palpitation and dyspnoea on exertion, dizziness, and loss of weight. On examination she was very pale and some purpuric spots were seen on the shoulders and arms. The spleen was large and painful; the liver was not palpable. No enlarged lymph

glands were found. The blood count showed a moderate anaemia and a definite lymphocytosis—11,500 white cells per c.mm., with 91.5 per cent. lymphocytes. The marrow was normally cellular, but 87 per cent. of the cells were lymphocytes. The patient was given iron and arsenic, and for three months her condition showed little change apart from slight improvement in the anaemia. During the next six weeks the white cell count rose gradually to 30,600 per c.mm., the differential count being unchanged. Radiotherapy was begun, but it was soon discontinued because, although the white cell count was reduced, the red cells were seriously diminished. From this time the anaemia became progressively worse, and petechial haemorrhages appeared on the shoulders and legs. The lymph glands in the axillae and neck became definitely enlarged. Eight months after her first attendance the anaemia was severe (950,000 red cells per c.mm.) and there were 7,400 white cells per c.mm., 97 per cent. of them lymphocytes. Her death was reported shortly afterwards; there was no necropsy.

Case II

A woman mantle-finisher aged 48 had been treated for "anaemia" for some months. About three months before admission she began to complain of abdominal discomfort after food; vomiting soon started, and the patient became very weak and exhausted. Abdominal distension appeared and steadily increased. Loss of weight was considerable. Examination showed a pale wasted woman with a large and distended abdomen. The spleen was very large, hard, and firm, moving on respiration. The liver was palpable 3 cm. below the right costal margin; it was smooth and firm. Small but firm lymph glands were palpable in the axillae and groins. There were no other noteworthy abnormalities. The Wassermann reaction was negative. The blood count showed a rather severe anaemia; white cells were 6,800 per c.mm., with 63.5 per cent. lymphocytes. The sternal marrow was very cellular, and contained 75 per cent. lymphocytes and 0.8 per cent. lymphoblasts.

Iron and arsenic was given and radiotherapy begun. But it was soon apparent that these measures would be ineffective. The anaemia rapidly increased and the patient died after six weeks in hospital. The leucocytes fell at the end to 2,600 per c.mm., with 75 per cent. lymphocytes. Post-mortem examination showed typical leukaemic changes in the lymph glands, spleen, liver, and elsewhere.

Case III

A painter aged 46 had noticed gradual swelling of the glands under the lower jaw for twelve months. He felt quite well and continued his work. No haemorrhages occurred and there was no loss of weight. His doctor, however, sent him to hospital for diagnosis of the glandular swelling. Examination showed a thin but healthy man. Below the jaw and extending parallel with the vertical rami on both sides were discrete, movable, painless glands of a fairly hard consistence. The axillary and inguinal glands were also palpable but not very large. The cervical lymph glands were not enlarged. In the abdomen neither the liver nor the spleen was palpable. The lungs showed normal air entry and the heart was of normal size. No other unusual features were found. The blood count showed no anaemia; there were 9,800 white cells per c.mm., 75 per cent. being lymphocytes. A gland was removed for histological examination. The normal architecture of the gland was found to have been replaced by an intense proliferation of lymphocytes. A radiograph of the chest showed no abnormalities in the lungs, heart, or mediastinum.

The patient was treated with iron. His condition remained stationary for six months, but the white cell count rose to 28,800 per c.mm., with 88 per cent. lymphocytes. The lymph glands around the jaw were now uncomfortably large, and radiotherapy was applied in an effort to reduce them. The results were not very satisfactory, but the white cell count fell to 8,600 per c.mm., 80 per cent. being lymphocytes.

Case IV

A platelayer aged 55 complained of lassitude, loss of weight, dyspnoea and palpitation on exertion, and headache, of two months' duration; increasing pallor had been noticed. Shortly before admission he had had ulceration of the gums, but these had not bled and were almost healed. Examination revealed a tall heavy man, notably pale. On the left lower buccal mucous membrane there was a healing ulcer about 1 cm. across. No haemorrhages were noticed. The splenic dullness was increased, but the spleen was not palpable. The liver was not enlarged and there were no enlarged lymph glands. Nothing of note was found in the heart, lungs, or central nervous system. The urine was normal. A fractional test meal showed hyperacidity. The Wassermann reaction was negative. The benzidine test for occult blood in the faeces was positive on two occasions. The blood count showed a moderate anaemia; the white cell count was 3,200 per c.mm., 64 per cent. being lymphocytes.

The sternal marrow was more cellular than usual; it contained 30.4 per cent. lymphocytes and 22 per cent. primitive-looking lymphoid cells, probably lymphoblasts; the normoblasts were active, and mitotic figures were seen in the early types; the granulocytes were greatly diminished and no mitoses were present.

The patient was treated with iron and arsenic, and the anaemia improved. Six months later, on his own initiative, three teeth were extracted, and there was severe haemorrhage. However, two months later he had recovered quite well and his haemoglobin was 64 per cent. Throughout the period of observation the white cell count remained low, but the percentage of lymphocytes rose slowly to 91.

Case V

A "make-up" man aged 58 had a sudden attack of severe pain in the left hypochondrium radiating to the left shoulder. Two further attacks occurred during the next week. For a fortnight he was off work and was then admitted to hospital. Apart from the loss of 8 lb. in six months there were no other symptoms. On examination the patient appeared well nourished but rather pale; the conjunctivae showed no pallor. The spleen was much enlarged, extending to the left iliac crest; it was firm and tender in some areas. The liver was also enlarged. The inguinal lymph glands were definitely enlarged, and there were numerous soft, discrete, but not very large glands palpable in the axillae. No other noteworthy points were observed. The Wassermann reaction was positive (1 in 4) in the blood but negative in the cerebrospinal fluid. The blood count showed a slight anaemia; white cells were 12,400 per c.mm., 77.5 per cent. of them lymphocytes. The marrow showed increased cellularity, 64 per cent. of the cells being lymphocytes.

In view of the positive Wassermann reaction treatment with mercurial inunctions and potassium iodide was given for a time in addition to iron. The anaemia improved and the spleen diminished slightly, but the lymph glands became a trifle larger. During the eight months the patient has been under observation his condition has remained stationary except for slow enlargement of the inguinal lymph glands. The blood count also remains stationary.

Discussion

The first diagnosis in these cases was not usually lymphatic leukaemia: splenic anaemia, Hodgkin's disease, or some other condition was suspected. My own experience, and that of other workers, shows that while lymphocytosis of the bone marrow—that is, 50 per cent. or more lymphocytes—is typical of lymphatic leukaemia, it is not usually present in other conditions involving lymphatic hyperplasia. In Hodgkin's disease no lymphocytosis was found by Nordenson (1935) or by Bodley Scott (1939), who quotes several other similar reports. Of seven cases

of lymphosarcoma Hynes (1939) found the marrow normal in six, but there were 61 per cent. lymphatic cells in the remaining patient's marrow. In a series of over 100 patients I have found lymphocytosis of the marrow in only two conditions besides lymphatic leukaemia; these are glandular fever and aplastic-type anaemias. In glandular fever the lymphoid cells in the marrow are increased—in one patient there were 55 per cent.—but if these are discounted all the other normal varieties of cells are present in their normal proportions. In aplastic-type anaemia there may be a marrow lymphocytosis of 70 per cent. or more; but this is only relative, and the raised percentage of lymphocytes is due to the decrease of all the other marrow cells.

Patients similar to those described here have been reported by Nordenson (1935), Schulten (1937), and Storti (1937). There seems, therefore, to be little doubt that the finding of lymphocytosis of the bone marrow is strong evidence that the patient has lymphatic leukaemia.

Clinically the patients fall roughly into two groups: an acute group (Cases I and II) with a fairly rapid course to a fatal termination, and a chronic group (Cases III, IV, and V) whose clinical and haematological condition remains stationary for long periods. In the acute group radiotherapy seems to be of little value; in the chronic group radiotherapy can be advantageously withheld for a long time, and, as in the somewhat similar myeloid leukaemia patients (Israëls, 1939b), treatment can be restricted to normal anti-anaemic measures so long as no severe anaemia occurs.

Summary

In patients with lymphatic leukaemia the sternal marrow shows a lymphocytosis even when the clinical signs and the peripheral blood pictures are atypical.

This lymphocytosis is strong evidence for the diagnosis of lymphatic leukaemia, since it is not usually found in other conditions.

The clinical course and the treatment of these atypical cases are briefly discussed.

I am indebted to Dr. John F. Wilkinson and the other members of the honorary staff of the Manchester Royal Infirmary who have made available the facilities necessary for this work.

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Two new corporations have been established in Washington for the relief of war suffering in Great Britain and France. One body, the American Society for British Medical and Civilian Aid, will work for relief in Great Britain; the other, the American Society for French Medical and Civilian Aid, is designed primarily to provide funds for the American Hospital in Paris, which now has 500 beds. Funds for British aid, raised, as in the last war, by public subscription in the United States, will be converted into goods in America, and will then be dispatched, partly through the American Red Cross for military wounded and sick, and partly through the Personal Service League for civilian sick and wounded.

THE SPREAD OF RETROPERITONEAL EFFUSIONS ARISING IN THE RENAL REGIONS*

BY

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Retroperitoneal effusions occur most commonly in the renal regions, and are the result usually of inflammation or trauma. The direction of spread of these accumulations depends on the arrangement of the fascia in the region, yet very few workers have ever attempted to determine accurately the fascial relations and attachments of the kidney. The really valuable contributions, such as those of Zuckerkandl (1883), Gerota (1895), Poirier (1907), and Southam (1922–3), can be counted on the fingers of one hand.

Experimental Investigations

In this investigation radiological methods were employed in addition to the usual anatomical procedures, and the observations are mainly based on the examination of twenty infants; many ordinary dissecting-room subjects have also been examined, though not by radiography. The method used was simple. A needle was inserted into the perinephric region through which a very fine barium emulsion was injected slowly under a pressure of about 75 to 100 mm. Hg. On an average each experiment occupied one and a half to two hours, and the spread of the emulsion was studied on the radiographic screen, plates being exposed at ten-minute intervals in most cases, or oftener if any interesting appearance was detected. After each experiment the specimens were dissected in order to determine accurately the position of the needle point and to establish that no barium had escaped into the peritoneal cavity, renal pelvis, or ureter. In twelve cases the needle point was in contact with the kidney or had penetrated or lacerated its surface, while in eight cases the point was in the paranephric fat behind the posterior layer of perirenal fascia. Seven experiments were failures and are not recorded.

The spread of the emulsion was remarkably constant. When the needle point lay close to the kidney in the perirenal space the barium emulsion, as shown by the shadow on the radiographic screen, soon assumed a more or less reniform appearance (Fig. 1), and it was established by subsequent dissection that the barium was outside the true renal capsule—between it and the perirenal fascia. At an early stage the space surrounding the suprarenal gland also became filled (Fig. 1), a graphic illustration of the fact that there is no complete fascial barrier, as some authors would have us believe, between the kidney and the suprarenal gland. Extension upwards was limited by the attachment of the perirenal fascia to the diaphragm, but the barium passed downwards, and to a lesser degree outwards, without any great difficulty. Sometimes there was an early spread downwards in the loose tissue around the ureter (Fig. 1), but more often the lower advancing edge of the barium covered a more extensive area. Laterally, as was established by dissection, the barium spread outwards to the level of fusion of the two layers of the perirenal fascia, but in a few cases the fusion was incomplete or the layers were readily disrupted, because the emulsion passed forwards for a variable

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distance between the transversus muscle and its fascia. Medially, strict localization to one side was a constant finding, the inner margin of the shadow being almost a straight line (Figs. 1 and 2). This unilateral spread was maintained until a late stage in the experiments, and then, often quite suddenly, a break-through occurred to the opposite side. This invariably took place in the lower lumbar region (Fig. 3). In five specimens no rupture occurred until the pressure was raised to over 200 mm. Hg, and in one case there was a break-through just below the diaphragm, but this did not happen until some time after the barium had broken through in the

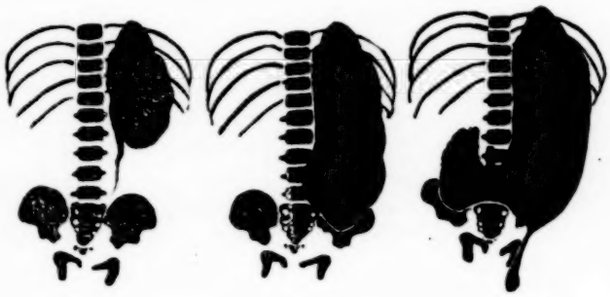

FIG. 1. FIG. 2. FIG. 3.

FIG. 1.—The barium emulsion has distended the space between the renal capsule and perirenal (renal) fascia. Note that the suprarenal compartment is also filled and that the barium has spread downwards in the loose periureteral tissue.

FIG. 2.—The barium has filled up the renal fossa and has spread downward to the pelvis. Note the strict unilateral localization, except in the lower lumbar region, where the break-through to the opposite side will occur.

FIG. 3.—The barium has broken through in the lower lumbar region and is extending upwards on the opposite side. Note the *upward* spread around the inferior vena cava, and the downward spread in the loose tissue surrounding a patent peritoneal vaginal process.

(These drawings are traced directly from the radiographs.)

lower lumbar region. There was no indication of any tendency to spread upwards into the thorax through the various openings in and behind the diaphragm. Extension into the pelvis usually occurred with almost surprising ease in the loose retroperitoneal tissue, and in one case the barium passed downwards along the inguinal canal (Fig. 3). At first sight it appeared that the peritoneum must have been punctured and that the barium was distending a patent vaginal process, but dissection showed that the spread was in the extraperitoneal connective tissue and that the peritoneal sac was uncontaminated. In seven of the twelve cases in this group the barium spread *upwards* from the lower lumbar region around the inferior vena cava (Fig. 3), and it was curious and interesting to observe that in no case did the barium extend inwards alongside the renal or suprarenal vessels—an indication of the close attachment between the perirenal fascia and the adventitial coats of the vessels.

When the needle point lay in the paranephric fat behind the posterior layer of perirenal fascia, the manner of spread was almost identical, except that diffusion appeared to be more rapid, the barium shadow did not outline the kidney and suprarenal, and there was no tendency to spread downwards along the ureter. The localization to one side was as distinct as before, and when extension to the opposite side occurred it did so in the lower lumbar region. There was still no invasion of the thorax, but there was less tendency to localization on the lateral side, the barium passing into the flank between the transversus muscle and transversalis fascia. Below, the barium passed between the iliacus fascia and muscle in several cases, and in one specimen it passed into the thigh postero-lateral to the femoral artery. The explanation of these results is to be found in the arrangement of the fascia.

Analysis of Results

Correlation of the experimental results with the appearances found on subsequent dissections has confirmed the general accuracy of Southam's observations, and it will be clear from the following brief description of the fascial arrangements why retroperitoneal effusions originating in the renal region should spread in the manner described above.

The kidney and suprarenal are surrounded by a loose investment of thinnish fascia, which is separated from the contained viscera by a variable amount of perinephric fat. This perirenal fascia consists of two layers: an anterior between the peritoneum and the renal capsule, and a posterior between the renal capsule and the fascia overlying the diaphragm, psoas major, quadratus lumborum, and transversus abdominis (Fig. 4). Poirier first cast doubts on the statement, still current in many textbooks, that the anterior layer extends across the front of the kidney and its vessels, to become continuous over the aorta and inferior vena cava with the corresponding layer of the opposite side, and he pointed out that perirenal suppuration remained localized to the side of origin, whereas it would spread readily to the opposite side if the anterior layers of perirenal fascia were continuous. He stated that the fascia can be traced as far as the pancreas and the root of the mesentery, there to become lost in the connective-tissue elements present in this situation, and Southam supports this statement. My experiments confirm the view that the two anterior layers are discontinuous, but they show that the anterior layers actually became attached to the bodies of the lumbar vertebrae and intervertebral disks a short distance in

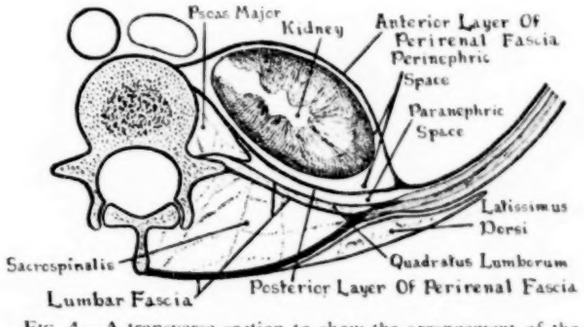

FIG. 4.—A transverse section to show the arrangement of the perirenal (renal) fascia and the perinephric and paranephric spaces. Note the attachment of the anterior layer of perirenal (renal) fascia to the bodies of the lumbar vertebrae.

front of the attachment of the posterior layer of perirenal fascia (Fig. 4), and that this union is firm above but becomes progressively weaker as the lumbo-sacral junction is approached. The posterior layer is carried medially in front of the fascia covering the quadratus lumborum and psoas muscles, but separated from them by a variable amount of adipose tissue known as the paranephric fat. Near the mid-line, where the fatty tissue is less plentiful, the posterior layer merges with the psoas fascia, and also becomes attached to the sides of the lumbar vertebral bodies and intervertebral disks, immediately anterior to the origin of the psoas major (Fig. 4), but, like the anterior layer, the attachment is firmer above than below.

Above, the perirenal fascia includes the suprarenal gland, a fact proved by the almost simultaneous filling of the renal and suprarenal loculi in the experiments (Fig. 5). This showed further that the fascial layer between the two organs is incomplete, or so tenuous in parts as to present no significant barrier to the spread of fluid. The anterior and posterior layers of perirenal fascia become fused above the suprarenal gland and gain attachment to the fascia on the under aspect of the diaphragm (Fig. 5), a union which is usually very firm, as Southam has emphasized. Laterally the two layers unite at a short distance from the outer renal margin, forming a vertical ribbon-like fascial condensation which merges with the transversalis fascia (Fig. 4). Southam states that this well-marked band is constantly present, but this is not so, either in infants or in adults; nor is the union laterally between the two layers always as firm as he asserts, for in some experiments the barium escaped without great difficulty from the perirenal pouch on the outer side. Inferiorly, as most writers state, the two layers remain discontinuous, the anterior gradually fading into the extraperitoneal tissue in the lumbo-sacral region, and the posterior blending with the iliacus fascia (Fig. 5).

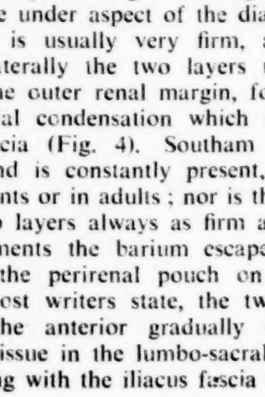

FIG. 5.—A sagittal section through the renal region showing the arrangement of the perirenal (renal) fascia.

Summary and Conclusions

A description is given of the spread of fluids: (*a*) from the perinephric space, included between the two layers of the perirenal fascia; and (*b*) from the paranephric space, lying between the posterior layer of perirenal fascia and the fascia overlying the muscles behind the kidney and the suprarenal gland.

The experiments detailed proved that there is no complete barrier separating renal and suprarenal fascial compartments.

It is shown that the spread is strictly limited to one side until a late stage, and that extension to the opposite side invariably occurs in the lower lumbar region.

Sometimes extension occurred downwards relatively early in the loose periureteral tissue, and invasion of the pelvis often took place with almost surprising ease. There was a tendency to *upward* spread along the lower part of the inferior vena cava, but no sign of invasion of the thorax through any opening in or behind the diaphragm.

The experiments proved that there is no continuity between the anterior layers of perirenal (renal) fascia on the two sides, and that these anterior layers, contrary to the usual description, gain a direct attachment to the lumbar vertebrae and intervertebral disks.

The experimental findings are correlated with those found at subsequent dissections, and a brief description of the arrangement of the fascia in the retroperitoneal regions is given.

I am indebted to Emeritus Professor A. Low and Professor R. D. Lockhart for permission to use the *x*-ray equipment in the anatomy department of Aberdeen University; and to Dr. Middleton Connon, radiologist to the department, for help in the interpretation of the skiagrams. The expenses of the investigation were defrayed by the Medical Research Council.

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ADVANTAGES AND DISADVANTAGES OF ENDOTRACHEAL ANAESTHESIA*

BY

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This is a subject with which anaesthetists are familiar. We cannot pretend to add anything new except our point of view. Endotracheal anaesthesia has had a vogue. Within recent times it might even be said that in some quarters it had become fashionable and was used where simpler methods might have been equally efficient. There are surgeons who welcome endotracheal anaesthesia even when it is far from essential. And there are surgeons who are content, and even prefer, to work amid difficulties to themselves and dangers to the patient rather than have intubation anaesthesia. Both enthusiasm and prejudice have long been equally powerful impediments to the progress of medical science.

We consider that the routine application of the same anaesthetic agent or the same method of its administration in a series of surgical cases without regard to the condition of the patient or the work of the surgeon is quite wrong and cannot be defended on scientific grounds. From the anaesthetist's point of view there is a definite group of surgical cases in which endotracheal anaesthesia is essential to the safety of the patient.

Advantages of Intubation

It is our intention merely to note some of the advantages that specially appeal to us in endotracheal anaesthesia. By means of intubation the anaesthetist is, once and for all, rid of the dead space of mouth and pharynx, as well as the essential factors in reflex respiratory spasm—the glottis and anoxaemia. As a result of intubation we have the perfect airway which is not affected by the mechanics of the dead space. Thus we have at all times absolute control of the depth of anaesthesia with the expenditure of a minimum of anaesthetic agent.

In the surgery of the upper abdomen and of the pelvis the advantages of intubation anaesthesia are often very

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conspicuous. The patient and the operation table, except the operation area, are completely covered with sterile sheets. The respiration is shallow and the recti are completely relaxed. The expenditure of energy by the patient is reduced to a minimum, and in prolonged operations, such as gastrectomies, splenectomies, and hysterectomies, strength can be maintained by artificial respiration with oxygen until transfusion of blood or gum saline has been accomplished. We are convinced that in prolonged and difficult operations with severe surgical shock and loss of blood many patients can be saved and others protected against a stormy convalescence by means of endotracheal anaesthesia.

In the repair of a cleft palate where a pharyngeal ridge has been prepared in an attempt to close the naso-pharyngeal space from the oropharyngeal space during speech it is essential that an endotracheal tube should be passed through the glottis either before or after operation, and should be left *in situ* for twelve to twenty-four hours to tide the patient over the period in which acute oedema of the glottis may occur. Some cases have been lost on account of supervening oedema and others have been saved by an immediate tracheotomy. The presence of an endotracheal catheter in the glottis for twenty-four hours does not necessarily render the patient free from the danger of oedema of the glottis, but in the vast majority of cases in our experience this protection has been adequate. Intubation is the ideal type of anaesthesia for oral surgery, and with a gauze pack saturated with liquid paraffin forms an effective barrier against foreign bodies or septic material reaching trachea or bronchi.

In cardiac surgery generally, but particularly in such proceedings as cardio-omentopexy, intubation anaesthesia with differential pressure is a very great advantage to the patient and to the surgeon. A pressure of 10 mm. Hg is kept up until the phrenic nerve has been crushed, when the pressure is allowed to drop to 5 mm. Hg. This fall in pressure allows the paralysed leaf of the diaphragm to come into view. As soon as the omentum is coupled to the heart muscle and the incision in the diaphragm closed the intrapulmonary pressure is raised to 10 mm. Hg. and this pressure is maintained to the end of the operation.

In cervical sympathectomy where an accidental pneumothorax may occur, and in excision of the oesophagus, the use of some kind of intrapulmonary pressure is essential. It is a great advantage in such cases to be able to maintain positive intrapulmonary pressure for several hours after the patient has returned to bed. This can be done by means of a stream of oxygen through the endotracheal tube left *in situ*, and helps to prevent the very considerable risk of post-operative atelectasis. Intubation permits of a highly efficient method of artificial respiration in cases of sudden collapse on the operation table.

Disadvantages of Endotracheal Anaesthesia

Certain sequelae may occur as the result of the passage of a tube through the glottis into the trachea. Granulomata on the vocal cords are not very uncommon and have been reported by R. J. Clausen (1932) and by Blair Gould (1935). Tracheitis may result from a hard tube impingeing for a period on the same area of the tracheal mucous membrane, and this is aggravated by a constant stream of irritating anaesthetic vapour on this area. Laryngitis and tracheitis are apt to occur if for any reason the tracheal tube is left *in situ* for several hours after the operation. Trauma to the nasal passages as evidenced by haemorrhage followed by adhesions and scarring is not so very infrequent. Laryngitis with loss of voice in some degree arises in a number of cases, and instances have been reported by Dawkins (1936). Is there anything that we anaesthetists can do to prevent these complications? They occur more often in nasal than in oral intubations. Coughing and spasm of the glottis following the passage of a tracheal tube result in most cases from an insufficient depth of preliminary anaesthesia, local or general, and may cause damage to the glottis.

We are of the opinion that blind intubation should be done only in the rare cases where direct vision cannot be employed because of deformities of the neck, lips, tongue, teeth, or pharynx. Blind intubation was used in the majority of reported cases of trauma to the nose and of laryngitis and granulomata of the cords. We consider that blind intubation should never even be attempted if direct vision can be employed, because it is a haphazard method of performing an operation which can be done with precision. We are convinced that oral intubation is the route of choice even in cases of oral surgery, provided the tracheal tube does not seriously hamper the work of the surgeon, and that in nasal intubation the catheter should be picked up in the pharynx with a forceps and passed through the glottis under direct vision.

The tendency in the modern teaching hospital is for a still larger proportion of the surgical cases to be done under expert methods of anaesthesia. The demands of patient and surgeon for the anaesthetic agent and the method of its administration at once safest, most efficient, and least likely to disturb convalescence or in any degree to initiate post-anaesthetic complications are opposed to the claims of the undergraduate. It is essential that the medical student, in his own interests as well as those of the public, should be taught methods of efficient anaesthesia which require simple apparatus and portable agents. There can be no doubt that a considerable percentage of the anaesthetic mortality of to-day can be traced to the inexperience of the administrators. Neither the patient, the surgeon, the undergraduate, nor the science of anaesthetics need be wholly sacrificed. Our own practice (Mackenzie, 1932) has been as follows. If the condition of the patient or the nature of the operation demands expert methods of anaesthesia, then the undergraduate must not be considered; but a balance is struck in his favour in all surgical cases in which simple and portable agents, such as ether, or ethyl chloride and ether, or even chloroform, can be used with safety to the patient and comfort to the surgeon.

Reports of sequelae would appear to have deterred both anaesthetists and surgeons from subjecting their patients to endotracheal anaesthesia. An analysis of 1,253 cases of endotracheal anaesthesia with Magill's rebreathing tube at this school during the past eighteen months—1,103 in adults, 150 in infants and children—shows that convalescence is uniformly good and compares favourably with that following other methods of anaesthesia. None of the cases has exhibited any of the sequelae which have been reported.

We believe that certain precautions in the technique of administration will do much to prevent these sequelae. These precautions are: (1) Suitable length and bore of endotracheal tube for the individual patient. The tube must not reach near the bifurcation of the trachea lest it enter either bronchus, with consequent collapse of the other lung. The bore of the tube should be such that it will not be in constant contact with the vocal cords. (2) Lubrication of the endotracheal tube with sterile paraffin wax or with a 10 per cent. percaine base ointment.

(3) Application to the nose and pharynx of a 10 per cent. or 20 per cent. cocaine spray combined in equal parts with ephedrine. (4) Careful lubrication of nasal passages with sterile liquid paraffin. (5) Intubation to be done, apart from exceptional cases, by direct vision.

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A PLEA FOR BETTER ENDOSCOPIC TRAINING*

BY

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Great advances have been made in the field of thoracic surgery within the last few years, and the operative risk is being reduced to a minimum. There is now a possibility of eradicating malignant disease of the lung, but operative measures must fail unless the disease is recognized early. The clinical diagnosis of primary carcinoma of the lung lies in the hands of the bronchoscopist.

For the last five years the records in the department under my charge in the Royal Infirmary, Edinburgh, and my own private records for the same period, include thirty-four cases of malignant disease of the lung diagnosed bronchoscopically, and of these one patient is alive over a period of two years and three over a period of one year. In every case the final diagnosis was made too late for operative intervention. The implantation of radium and radon seeds has been tried without success. *X*-ray therapy has as yet failed to cure, although it has in some cases retarded the progress of the disease. During the same period in the surgical and medical wards of the Royal Infirmary, Edinburgh, 182 cases (apart from those mentioned above) have been diagnosed as carcinoma of the bronchus, either clinically and radiologically or after a post-mortem examination. None of these was referred to the bronchoscopist for confirmation of the diagnosis. Operative intervention was not considered possible. *X*-ray treatment was tried in many cases without any cure.

It would seem either that there is a lack of co-operation between the physician and the bronchoscopist, or that patients are too late in reporting to the physician for treatment. Early symptoms may be overlooked, but if there is a suspicion of the presence of malignant disease reference should be made to the bronchoscopist for diagnosis. The physician in the past has tended to rely for confirmation on *x*-ray findings. A commencing carcinoma of the bronchus which could be revealed on bronchoscopic examination may show clinically only as an occasional haemoptysis and not at all on the *x*-ray film. To wait for a shadow on an *x*-ray plate before completing the diagnosis may be rendering operative eradication of the disease impossible. Thus the onus of early diagnosis rests with the bronchoscopist to whom the case is referred. Is our endoscopic training sufficient to justify this responsibility?

* Read in opening a discussion in the Section of Oto-rhino-laryngology at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

The Advance of Endoscopy

Twenty years ago the possibility of examining the inside of the lung was unknown to many. When Chevalier Jackson spoke at a meeting at Bath in 1925 only a few laryngologists possessed the necessary armamentarium for bronchoscopy and still fewer had the experience. The science of endoscopy has advanced rapidly. It is recognized by the physician as a definite practical means of diagnosis, but yet it seems that this form of diagnostic examination has not been developed on wide enough lines.

In America endoscopy has been established as a branch of laryngology, but has also been developed on lines apart from its mother specialty. There is a bronchoscopic clinic attached to a great many of the larger hospitals where cases can be referred for diagnosis and treatment. In this way operative training can be obtained, as well as the practical experience necessary for efficient diagnosis. Many from this country have taken advantage of the training offered in these clinics and have afterwards developed a specialty of bronchoscopy on their own lines, but always as a part of oto-laryngology. Cases referred for bronchoscopic examination have to take their turn with all the other cases of a busy oto-laryngological department.

Establishment of Central Endoscopic Clinics

Financially the establishment of similar clinics in this country is impossible until State medicine presents a Utopia where work would be the first consideration—the State supplying the means to live. It might be possible, however, for the several oto-laryngological departments, say in one town or in one area, to combine to form a central endoscopic clinic to which cases could be referred direct on specified days. This would allow of the segregation of the endoscopic from the purely oto-laryngological cases. More time could be given to these cases, and those working in that department would therefore gain more experience and obtain a better training. The necessary armamentarium could be enlarged instead of being so often a bare minimum, and special beds might be available.

A precedent for such clinics already exists in the formation of orthopaedic clinics and neurosurgical clinics in the department of surgery. In some centres thoracic surgery is being established as a specialty. There it might be possible to develop endoscopy and thoracic surgery side by side. The need for early and efficient diagnosis no longer allows of a place for the occasional bronchoscopist.

Unfortunately in this country we are unable to establish training centres such as exist in America and Paris, where operative technique can be taught on the cadaver and living animals, such as dogs. Here we can learn to pass the bronchoscope on the cadaver; but owing to various Home Office regulations we can only pass a bronchoscope on living animals under licence, using a general anaesthetic. If we employ a local anaesthetic we lay ourselves open to outside criticism, although it has been demonstrated that the bronchoscope can be passed without pain or harm to the living model.

There can be no doubt, however, that greater experience could be obtained and teaching be benefited if we had specialized centres instead of numerous small clinics. We have a great opportunity for the organization of endoscopic centres in the hospitals given over entirely to diseases of the chest (apart from phthisis). In these hospitals the physician carries out his own bronchoscopy

as part of his routine examination. It must be remembered, however, that no bronchoscopy should be performed without thorough preliminary examination of the nose, nasopharynx, and larynx. The truth of this precept, which has been emphasized by Chevalier Jackson, has been borne out in my own experience. Many cases referred to my department as bronchiectasis have proved on examination to be chronic bronchitis with some dilatation of the bronchi secondary to a post-nasal discharge as the result of an ethmoid infection with nasal polypi, or an antral infection. The elimination of the cause has very often cleared up the chest condition without the necessity for endoscopy.

The Practice of Bronchoscopy

Unfortunately there is a tendency in this country to consider bronchoscopy a difficult operation requiring the aid of a specialized anaesthesia, whereas it is a simple though specialized examination of the oesophagus and the lower air passages with a view to aiding the physician or thoracic surgeon as cystoscopy aids the abdominal surgeon. The operative field of bronchoscopy and oesophagoscopy is practically limited to the removal of tissue for pathological report and the removal of foreign bodies. The removal of a foreign body is attempted by many without much previous training, and yet all of us who have worked with Chevalier Jackson know that his removal of a foreign body from the bronchus in thirty seconds required hours of practice before the operation, to make certain that his eye, hands, and forceps were perfect.

This practice can be obtained quite effectively by the use of a mannikin in which one can reproduce the position of the foreign body seen in the radiograph and practise its effective removal. Fortunately, perhaps, in this country very few cases of foreign bodies in the bronchus occur. Why there should be this difference from other countries has never been explained, although it suggests that our diagnosis is incomplete—another plea for closer co-operation between physician, radiologist, and bronchoscopist.

Summary

To sum up, the need for earlier diagnosis of carcinoma of the bronchus must be recognized by everyone. In recent publications the thoracic surgeon has proved that mortality in chest surgery is almost negligible. The deep *x* ray therapist has to admit failure. In a few apparent cures the presence of malignant disease has been demonstrated by only *x* rays—the findings have never been histologically confirmed. In other words, the case has never been referred for endoscopic diagnosis. It would therefore appear that the bronchoscopist must give the initial and final diagnosis, and then, along with the radiologist, judge which cases might be referred to the thoracic surgeon with a hopeful operative prognosis. The need for training and for co-operation is very evident. Training and co-operation are impossible unless endoscopic cases can be centralized to special departments. Whether this department should remain under the specialty of laryngology or become a branch of thoracic surgery may yet have to be decided. Personally I cannot envisage an endoscopist who is not a trained laryngologist.

Ozaena.—According to Halász, ozaena is caused by lack of a "tonsillar hormone" which is similar to acetylcholine. A method of treatment is described.—Some New Data concerning Pathology and Treatment of Ozaena. H. G. Halász.—*J. Laryng.*, May, 1939, **54**, No. 5, 245.

Clinical Memoranda

Multiple Fractures without Patient's Knowledge

The following case is worthy of record as one in which multiple fractures of several long bones occurred without the knowledge of the patient.

CASE REPORT

A married woman aged 64 was admitted to the Buxton Clinic for Rheumatism and Allied Diseases on July 20, 1937. She gave a history of pain in the muscles of the back, the ribs, shoulders, and arms for about five years; the pain was always worse in winter. In August, 1936, she knocked her right leg, which became very swollen and painful: the diagnosis was inflammation of the bone. In 1914 she had a great deal of pain in the legs, and red blotches and lumps, which lasted for months, appeared. Apart from an operation for gastric ulcer in 1926 she had been healthy all her life. Her father, mother, and sister had suffered from rheumatism, but otherwise the family history was of no medical interest; she had had seven children.

When admitted she had been using crutches for six months, and complained of stiffness and pain in the arms, legs, and back; that lifting weights hurt her; and that slight knocks produced pain. On examination the movements of the joints were good; the right tibia was bowed, and there was deformity and unnatural mobility, accompanied by pain in the upper third of the right tibia. The bones and muscles of the left leg below the knee were very tender on palpation, the trochanter of the left femur was thickened and tender, and nodules were palpable on the left ulna and the ribs in the left axilla. Apart from some myocardial degeneration the circulatory system was normal. The blood pressure was 190/120. The sclerotics were not blue and there was no deafness.

X-ray examination revealed fractures, sometimes multiple, in most of the long bones: the right ulna had three fractures and the left a single one, the radii being intact but very porotic, with only a faint cortical outline; the right tibia and fibula showed fractures about six inches below the knee-joint which had united at an angle of about 160 degrees; the right fibula had also been fractured above the ankle. The left tibia showed a fracture below the knee-joint, and several fractures were observable in the middle and lower thirds of the fibula. There was a fracture in the neck of the right femur, while the left one was intact but porotic; the hip-joint spaces were slightly narrowed. The pelvis was malacic in type, with a flattened cavity and symmetrical fractures of the inferior rami of the ischii. The vertebrae were somewhat decalcified, but the joints were clear and there was no evidence of ligamentary calcification. The skull was normal.

The fractures had healed in most instances without the formation of the normal amount of callus, the union being apparently of a fibrous nature.

Laboratory Examinations.—Serum calcium, 9.1 mg. per 100 c.cm.; magnesium, 2.2; inorganic phosphorus, 3; phosphatase, 0.89 units (normal, under 0.25); icterus index, 2 units. Suspension stability after one hour, 89 per cent.; red cells, 4,900,000 per c.mm.; white cells, 7,700 per c.mm.; haemoglobin, 62 per cent.; colour index, 0.63; polymorph neutrophils 63 per cent., eosinophils 2 per cent., small lymphocytes 23 per cent., large lymphocytes 6 per cent., monocytes 6 per cent. Urine (twenty-four-hour sample): total nitrogen, 6.2 grammes; P_2O_5, 1.17 grammes; calcium, 0.103 gramme; magnesium, 0.084 gramme. No alkaline tide could be found, and the patient was therefore probably achlorhydric.

At the date of the examination the patient was not excreting an abnormal amount of calcium in the urine, and the Ca : P

of the blood was not sufficiently subnormal to account for the malacic condition of the bones. It must be concluded that the activity of the disease process responsible for the osteomalacia had ceased, and no explanation of its aetiology can be suggested. The patient was placed on a diet rich in calcium and vitamins, supplemented with concentrates, and was kept at rest in bed. She was discharged on August 3, 1937, to her home, and advised to continue with a rich vitamin diet reinforced with A and C concentrates. On May 31, 1939, she reported that she was very well, had no pain, and could walk up and down stairs without help, although she used a crutch at times as a precautionary measure.

The condition was evidently an osteomalacia of unknown origin so active as to produce a bone picture indistinguishable from fragilitas ossium.

I am indebted to Dr. J. A. Harburn for permission to publish this record, and to Mr. J. Race, biochemist to the Devonshire Royal Hospital, who undertook the laboratory investigations.

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A Case of Hydatid Disease

The incidence of hydatid disease is so rare in this country that the following case is worthy of notice.

CASE REPORT

The patient, a man aged 72, consulted me in May, 1939, and stated that he had been "in poor health on and off for over thirty years." On interrogation he said that he had noticed the passage of small grape-like structures in the urine every spring and autumn since 1900, and that for the past two years he had suffered from periodic attacks of abdominal pain, unrelated to the intake of food and not relieved by any medicine or powder which he apparently had been in the habit of taking. Specimens of urine were submitted to the Clinical Research Association Ltd., and the following laboratory report, dated March 14, 1903, was obtained.

"The specimen received March 13, 1903, has been examined. The centrifugalized deposit from the urine contained traces of pus and blood, with a good many vesical squamae and a very small number of calcium oxalate crystals. The specimen contained in the urine was an entire hydatid cyst, and in the fluid within it both scolices and large numbers of the characteristic hooklets were found."

On August 8, 1939, the patient coughed up a tablespoonful of blood and complained of some dyspnoea on exertion; the left side of his chest was absolutely dull on percussion and the heart was so displaced to the right side that the apex beat was palpable in the right sixth intercostal space. From that date his dyspnoea gradually increased and he had occasional slight haemoptyses. Two months later he died, and a post-mortem examination was conducted by the county pathologist.

Pathological Report.—The left pleural cavity was full of semi-purulent fluid and contained a number of large lens-shaped hydatid cysts. Owing to the intrapleural pressure the left lung was completely collapsed and there was a purulent secretion in the bronchial tubes. The right kidney was hypertrophied but otherwise normal. The left kidney tissue had been replaced by a large number of hydatid cysts about the size of marbles; some contained cloudy fluid, some were full of caseous material, and a few were calcified. The left ureter was intact and, apart from some thickening of its walls, appeared normal. Two coils of small intestine were firmly adherent to the capsule of the left kidney, and were probably responsible for the spasms of abdominal pain from which the patient had suffered for two years. No other organ showed evidence of hydatid disease.

Wellington, Somerset. S. MCCLEMENTS, M.R.C.S.

Reviews

THYROID DISEASE

The Diagnosis and Treatment of Diseases of the Thyroid. By James H. Means, M.D., and Edward P. Richardson, M.D. (Pp. 367; 51 figures. 21s. net.) London: Oxford University Press. 1939.

The thyroid gland is sufficiently obvious to have given rise to comment through the ages both in medicine and in art. But there is no doubt that environmental conditions lead to much variety in manifestations of thyroid affections in different countries. Drs. Means and Richardson have collated the experiences of the Thyroid Clinic of the Massachusetts General Hospital on the patients under their care since the institution of the clinic in 1913, and at the same time have filled in the background of the various conditions of thyroid disease by a summary of present-day knowledge. It may be said at once that the case histories and personal experiences are of much greater value than the general comment, which often appears to be undigested. This may be because there is still much more to be known of thyroid disease.

Thyroid function in health is that of a catalytic process accelerating oxidative processes in all tissue cells, and increasing especially the nitrogenous, respiratory, and inorganic salt metabolism. The source of the thyroid hormone is not clear, and a purely pathological classification according to changes in parenchyma, colloid, or stroma is not yet attainable. Certain clinical entities in which these several changes may occur are recognizable, though there is a gradual transition from diffuse colloid goitre, adenomatous goitre, and exophthalmic goitre, so that there are many intermediate forms. It is perhaps too early to recognize one form of hyperthyroidism with partial advances and regressions; the authors do not attempt this synthesis.

After a general chapter on the principles of diagnosis and treatment of thyroid diseases, embracing notes on the anatomical relations of the gland and the methods of examination at the bedside, the various operative procedures and possible post-operative complications, the authors discuss systematically the types of enlargement and excessive or diminished activity of the gland. Colloid goitre is a common malady. Its most striking feature is its geographical distribution; in general the regions that are goitrous are geologically either mountainous or old glacial areas, though it may occur sporadically in non-goitrous districts. It is held to be associated with deficiency of iodine; but the lack of iodine is relative, not absolute, and may be brought about by infection. Symptoms are non-existent, but there may be associated over- or under-function of the thyroid, resulting in thyrotoxicosis or myxoedema.

The authors approach the subject of exophthalmic goitre from the clinical side, the diagnosis being usually apparent. A long discussion of the pathology follows but is without conclusion or value. They find that evidence in support of the pituitary hypothesis of exophthalmic goitre is negative: there is little reason to maintain that the pituitary is hyperfunctioning in ordinary cases of exophthalmic goitre. To English views the artificial separation of cases of exophthalmic goitre from toxic adenoma is not satisfactory, and the authors themselves comment on the intermediate cases. There is a distinct improvement in the firmness of writing and soundness of judgment in the authors' statement on treatment and the description of actual case histories. But the

chapter on adenomatous goitre is unclear, including as it does the conditions we recognize as toxic adenoma or secondary thyrotoxicosis and the true adenoma, foetal adenoma, which can only be treated satisfactorily by surgery. And this chapter is separated from that on tumours, especially malignant tumours, of the thyroid by descriptions of myxoedema and cretinism. The book is therefore variable in its clarity and appeal, representing an individual attitude. This may have been aimed at as an expression of the opinions of the gifted workers at the Massachusetts General Hospital. Some of the authors' expressions are infelicitous, but these do not seriously detract from an honest attempt to clear the ground for what may in time be a useful description of thyroid diseases.

THE ORIGIN OF LIFE

Life's Beginning on the Earth. By R. Beutner, M.D., Ph.D. (Pp. 222; 80 figures. 12s. 6d. net.) London: Chapman and Hall. 1939.

After Wöhler in 1821 broke down the barrier between organic and inorganic chemistry, science took up the question, hitherto only answered by mythology, of the origin of life. The doctrine of spontaneous generation from putrefaction and fermentation had considerable support until overthrown by Pasteur, and even then lingered on into the eighties of last century. For a good many years after that, although the battle for and against vitalism continued to rage, both sides in that combat seemed to lose interest in the origin of life itself, so fully occupied were they in investigating its phenomena. Now that vitalism is in full retreat and biochemistry is rapidly advancing it is not surprising that the old problem is rising again in a new form. Dr. Beutner's book *Life's Beginning on the Earth* is an interesting contribution to the study of that problem, though the author does not seem quite to have made up his mind whether he is writing for a scientific or for a popular audience.

As he points out, the hypothesis that life was sprayed on to the earth by some passing meteorite is no solution, since it merely throws the question a step further back. He starts with a comparison between vital growth and crystallization, quoting some curious observations of Pfeiffer on the modifications produced in the shape of crystals by the addition of plant juice. Thus the addition of a single drop of an extract of water-lily to a solution of copper chloride causes the subsequent crystallization to imitate the shape of a water-lily. Evidently chemical influences help to determine the familiar shapes of living tissues and can be conveyed to lifeless material. Pfeiffer is now trying to apply this method to the recognition of the toxins formed in disease, but so far his deductions are decidedly speculative. Our author calls attention to many other interesting simulations of vital structures by dead matter, including the amoeboid movements of oil-drops. This merely shows that organic and inorganic material obey similar physical and chemical laws, and prepares the way for his thesis that crystallization is compatible with life, as demonstrated by W. M. Stanley's success (1935) in crystallizing the virus which produces the mosaic disease of the tobacco plant. Even if the crystallization of the virus is repeated ten times its activity in producing the disease is unimpaired. The outstanding property of living matter is the ability to grow and propagate itself in an environment different from itself, and a virus is capable of transforming its food material and of propagating itself so long as there is suitable food available. And yet it is a chemically pure substance, as evidenced by its capacity to adopt crystalline form. It acts like an unorganized enzyme, and is certainly not cellular. He thinks that this is the simplest thing which can be called alive, and that once such a self-regenerating enzyme has arisen the ordinary processes of differentiation by evolution could start. His suggestion as to the way in which such an enzyme originated from the substrate of carbon compounds formed during the cooling of the earth may strike us as highly speculative, for he invokes the aid of lightning, relying on Haber's work on the organic compounds formed by the passage of electric discharges through carbon-containing gases.

Dr. Beutner quotes Oparin's interesting speculations (1938) based on the reasonable assumption that as the boiling-points of carbon and heavy metals are extremely high they would be the first to solidify as the earth began to cool, with the formation of carbides. In the presence of overheated steam vapour interactions between carbides and steam would result in the production of enormous amounts of hydrocarbons. This, by the way, is a cheering thought, suggesting that we are by no means dependent merely on the coal-measures for our supplies of the mineral oils of which we are now so prodigal. The atmosphere of the earliest earth must have contained large amounts of ammonia, and this interacting with the primary carbon compounds would lead to the production of amino-acids, the basic constituents of protein. The chemistry sounds plausible, but we should like more evidence concerning the "vital spark."

PHOTOGRAPHY OF THE FUNDUS

Atlas Clinique d'Ophtalmoscopie Photographique. Syndromes Cliniques du Fond de l'Œil. By Henri Tillé and A. Couadau. (Pp. 194; 202 figures. 280 fr.) Paris: Masson et Cie. 1939.

There is something peculiarly attractive in an atlas of fundus drawings of the human eye. Many of these are real works of art, as well as treasures of observation and careful record. To mention only one of many of these atlases, that of Adams Frost might be taken as a perfect example of what can be done and has been done in this regard. These former atlases were full of pictures in colour reproduced by lithography or colour photography from drawings made by the observer. He looked into the eye with his ophthalmoscope and first drew outlines of what he saw as accurately as he could, and then coloured it to make it as nearly like the actual fundus as possible.

To-day a new fashion has come into vogue. Direct photography of the fundus is the aim. A fine atlas of such photographs has been published in France by Henri Tillé and A. Couadau. It contains no fewer than 202 figures—photographs of all sorts of fundus conditions. The skill of the photographers is shown in the size of the pictures, many of which measure six inches in diameter, and in all there is a complete absence of the white patches which were such a trouble in the early photographs. Every photograph has a clinical note of the case or of the condition, and the name of each is given in both French and English.

As an example of fundus photography this atlas represents a triumph of industry and skill on the part of its producers. But when we come to consider it as a record of fundus appearances it must be confessed that it is sadly disappointing. The photographic picture is as little like the appearance of the fundus as seen by the eye of the observer with an ophthalmoscope as a smoke-grimed cellar of a boiler-house is like the vivid picture of a sun-lit landscape. In truth, the contrast is greater, for not

only are the photographs in dull black printing-ink instead of in the real colours of the fundus, but there is in all of them an entire lack of that marvellous definition and clearness of outline and detail which are seen in most fundus observations—indeed, in all save those where the media of the eye are clouded. The photographs are blurred in outline and consequently convey a very poor impression of the real fundus appearances.

It is right to try to secure photographs of the fundus. If good photographs could be obtained they would allow of records being made at successive periods in cases where it is desirable or necessary to secure a greater accuracy of definition than can be presented by the artist. But for educational purposes, for teaching medical students what they should see with an ophthalmoscope, we doubt if photography will ever be able to compete with the work of the artist, and particularly with the work of the ophthalmic surgeon who is himself the artist. Nevertheless, we repeat that as an atlas of fundus photography this book is a great piece of work and is a credit to its authors.

A STUDY OF GESTURE

The Language of Gesture. By Macdonald Critchley, M.D., F.R.C.P. (Pp. 128. 5s. net.) London: Edward Arnold. 1939.

Dr. Macdonald Critchley has followed Bacon's injunction to study "The Doctrine of Gesture or the Motions of the Body with a view to their Interpretation." He has cast his net wide and collected information from differing ages and races, with some interesting results. He concludes that gesture can be broadly divided into two main groups. The first are symbolic, conventional, or empirical gestures which require interpretation; these are utilized for obvious reasons by members of secret brotherhoods, and in the language of religious symbolism. The second is composed of those signs which bear an obvious interpretation, age-old and universal; they constitute a silent *lingua franca* within the comprehension of all and can readily express emotion but not abstractions. They often need reinforcement by a number of empirical signs really belonging to the first category. Such a hybrid sign-language is found in the gestural systems of the deaf and dumb. Both these types, symbolic and instinctive, are of great antiquity, but the latter are more primitive and fundamental, often falling within the comprehension of animals, of young children before the acquisition of speech, and of mental defectives. Gesture, then, is a kind of italicized speech, while pantomime is silent acting.

On the way to these conclusions we are led along several pleasant by-ways, such as the distinction between voluntary though instinctive gestures and the involuntary emotional expressions of the autonomic nervous system, the relation of gesture to the origin of speech, and the evolution of drama from emotional expression in the dance, now sophisticated into the ballet. For the medical man perhaps the second of these topics has the most direct appeal, since he finds the speech centre so closely linked with that for the gestures of the right hand. The two hypotheses of the origin of speech were flippantly labelled by Max Müller the "bow-wow" and the "ding-dong." The first corresponds to the theory of onomatopoeia and the second to Sir Richard Paget's view that all speech is an elaboration of buccal-labio-lingual gesture. This approximates to the "yo-heave-ho" hypothesis, according to which speech is the outcome of man's muscular exertions in which the laryngeal muscles share. Dr. Critchley does not express any opinion on the theory that it is an early but temporary activity of an originally bilateral speech centre which accounts for the reduplicated syllables of a child's first verbal utterances—"da-da," "mam-ma," "nan-na." This finds expression later on not only in the "cocky-locky, henny-penny" tautology of nursery literature, but in a good deal that has recently been written presumably for adults.

STRUCTURE BY THE LIGHT OF FUNCTION

Anatomie Générale. Origines des Formes et des Structures Anatomiques. By H. Rouvière. (Pp. 192; 96 figures. 70 fr.) Paris: Masson et Cie. 1939.

The trend of this work on "general anatomy" and "the origin of form and anatomical structure" is, as these terms imply, the treatment of anatomy and development from the general standpoint rather than from the particular. Thus the structural details of any particular part are considered simply as illustrating general principles, such as the dependence of structure partly on heredity and partly on function and also the influence of physical and chemical factors. The author shows how development occurs by differentiation which is dependent on characters transmitted in the germ but which only become manifest at different stages in ontogeny. He demonstrates that differentiation of tissues or organs is usually in advance of the special functions which each tissue or organ will at a later stage of development be destined to perform. Thus muscle fibres and glands are developed before contraction or secretion occurs. With reference to these observations, he discusses the problem of how certain somatic changes induced by pressure or other causes have become inherited—for example, the sternal and pubic callosities of the ostrich, which are developed before the chick is hatched—or the orientation of the bony trabeculae, in the lower and inner part of the neck of the femur of young infants, in the same directions as in the adult; that is to say, following the lines of pressure and strain which the bone is subjected to in the adult, although in the young infant the bone is not yet subjected to these forces.

Professor Rouvière in successive chapters discusses such topics as the mechanisms by which bony ridges or depressions are produced; the articular expansions at the ends of a long bone; the arrangement of fibres in ligaments and tendons; the direction of muscle fibres, and the relation of tendinous intersections in muscles to their nerve supply; the reasons for the presence or absence of elastic fibres in ligamentous bands; the structural variations which exist in the walls of arteries, veins, and lymphatics, and the nature of fissuration and lobation of such organs as the lungs and liver and in the kidneys of certain animals.

The book is a philosophical treatise of great value; it gives a mechanical explanation and a precise meaning to many details of anatomical structure, and it should be read by all those who are interested in evolution and inheritance, and the correlation and dependence of structure on function.

Notes on Books

The Primer of Allergy, with its subtitle "A Guidebook for Those who Must Find their Way through the Mazes of this Strange and Tantalizing State," is intended for the patients, and not for the instruction, of the medical practitioner. But it differs from most publications designed for lay consumption in more respects than one. It is written by the author, Dr. WARREN T. VAUGHAN, of an exhaustive and serious treatise on the *Practice of Allergy* (reviewed in our issue of November 4); it came out at the same time as the professional work, and supplies in a light and bright dress the information given

for the patient's guidance in the earlier editions of this treatise. It is indeed a rather unusual gift to be able to address two different audiences with equal success. The author has felt the want of such a book to hand to patients, and probably many medical practitioners will find their time can be saved by recommending this *Primer* to their allergic patients. It is published at 7s. 6d. by Henry Kimpton.

There are many excellent textbooks of gynaecology, and to justify its publication a new one should make some worthwhile contribution to the subject. Written primarily for final-year students at Sydney, Dr. HERBERT H. SCHLINK'S *Gynaecology* (London and Sydney: Angus and Robertson; 32s. 6d.) records the teaching and practice at the Royal Prince Alfred Hospital, but contributes little that is new. Many excellent results are claimed, but the methods used are not always those generally adopted, as, for example, the performance of a Wertheim hysterectomy for carcinoma of the body of the uterus. A major criticism of the book is that alternative methods, even though widely practised elsewhere, are often not mentioned. Endocrinological aspects of the subject are for the most part not well discussed, and the author's experience of hormone therapy has been unfortunate. The need for a sound pathological background is well stressed, and throughout the book pathology is simply described and well illustrated, though on two occasions (Figs. 64, 65) the key to the illustration has been omitted. The chapter dealing with the examination of the patient and ethical problems is filled with excellent advice and may be compared to the pearl in the oyster.

Dr. RODERICK HEFFRON'S book on *Pneumonia* is the third of a series on the subject planned by the Massachusetts Pneumonia Study and Service conducted by the State Department of Public Health and financed by the Commonwealth Fund. What a monument of industry it is can be gathered from the facts that there are nearly a thousand pages of text and seventy-six pages of bibliography containing 1,471 references. It brings together a comprehensive review of investigations dealing with the inciting agent, the lesions produced, the clinical aspects, and the factors influencing prevention, prognosis, and treatment. The results of specific therapy in a large series of collected cases are a special feature of the book, and these details provide a useful guide to the practitioner embarking on that hitherto rather uncharted sea. Starting with pneumonia as found in Egyptian mummies and going on to the latest bacteriological findings and most recent views on anti-pneumococcic serum, it is difficult to believe that any single relevant fact can have been omitted. Happy the country that can provide the funds for such painstaking and meritorious research. The book is published in London by the Oxford University Press at 24s.

That Drs. L. E. H. WHITBY and C. J. C. BRITTON'S *Disorders of the Blood*, which originally came out in 1935, has already reached a third edition is convincing evidence that it is widely recognized as fully meeting the need for an up-to-date and authoritative work of reference on this rapidly advancing subject. Although it is only two years since the second edition appeared, a number of additions have now been made, especially on the haemolytic anaemias, technique, including that of sternal puncture, and the new pigment methaemalbumen. The publishers are J. and A. Churchill, and the price 21s.

In *Die Kreuzschmerzen der Frau: Ihre Deutung und Behandlung Gynäkologische Orthopädie*, Professor HEINRICH MARTIUS of the Göttingen University Women's Clinic contributes an interesting study of backache taken as a definite gynaecological entity. In the first half of his treatise he deals with the pathological causes in the pelvis; in the second and larger portion he treats it as an orthopaedic problem. Dr. Martius begins with an interesting and careful study of the finer anatomy of the pelvic organs, and shows that the sacrum has an abundant supply of spinal nerve receptors. The sympathetic and parasympathetic fibres, though only occasionally themselves conveying pain, can convey, via the plexuses, sensations of pressure or tension from the rectal or genital organs to the spinal nerves. Pain will be referred to the parametrium fixed over the sacrum, though possibly originating on one or other side. Apart from gross tumours and inflammatory lesions, the importance of correct diagnosis in order to secure correct treatment is insisted upon. That backache may be psychogenic is admitted—a bad conscience, a memory of injury, etc.—but the possibility of spasm of smaller muscle bundles such as that in the utero-sacral ligaments, or of the pyriformis, has to be remembered. Also varicosities within the pelvis, or even thromboses; and of under-development, for which radiological treatment is advised. The author's main interest, however, lies in the orthostatics of the human female body, built for its great purpose of propagation; and he strives by bands and belts and exercises to correct the mistake of having assumed the upright position. The sketches of muscle and joint action are delicate and beautiful. There is much that is of use and value in the argument and teaching given. The publisher is Georg Thieme of Leipzig.

Preparations and Appliances

PLEURAL DRAINAGE TUBE

Mr. P. R. ALLISON, Ch.M., F.R.C.S., honorary assistant surgeon, the General Infirmary at Leeds, honorary surgeon, Leeds Public Dispensary and Hospital, writes:

The type of tube used for the draining of an empyema cavity must be chosen in each case according to the particular shape and size of the cavity. A tube which is useful when the cavity is first drained may have to be altered frequently during the course of healing. No one tube, therefore, can be recommended for general use, but the accompanying illustration (Fig. 1) shows a tube which has been made for me by the Genito-Urinary Manufacturing Company and one which I have found useful in selected cases. It is a simple form of self-retaining catheter with a prolongation of the tube beyond the flanged end. The flange is set at an angle to the shaft

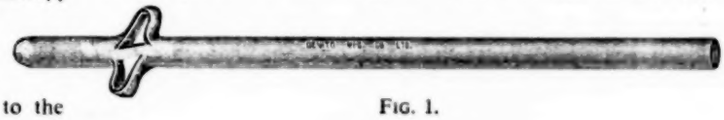

FIG. 1.

FIG. 2.—Illustrating use of tube in empyema cavity, which has healed more quickly at base than at apex.

of the tube as shown. Holes can be cut in the distal part of the tube to suit individual cases.

I have used the tube particularly in the first week or fortnight after a lower lobe lobectomy, when the prolongated end helps to prevent the pleural cavity being shut off from the site of drainage by expansion of the upper lobe and elevation of the diaphragm. I have also used it in those cases of empyema where the basal part of the cavity heals more quickly than the apical part (Fig. 2) and where the more usual types of self-retaining tubes tend to become obstructed.

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NUTRITIVE VALUE OF RAW AND PASTEURIZED MILK

Five years ago the Milk Nutrition Committee planned a series of experiments to find out as definitely and as authoritatively as possible whether any real difference existed between the nutritive value of raw and of pasteurized milk. Three reports have already been issued. The first dealt mainly with observations on rats, and the third with observations on calves. The second was an interim report describing the effects of dietary supplements of raw and pasteurized milk on the growth and health of school children. The fourth and last report, which is just published, completes the second, and furnishes a summary of the results of all the experiments together with the conclusions to be drawn from them.[1]

The observations on school children were intended to provide not only a comparison of the relative values of raw and pasteurized milk but a justification of the milk-in-schools scheme. It was desired, in fact, to obtain some quantitative estimate of the beneficial effect of a milk supplement to the diet of growing children. Altogether 8,435 children, aged 5 to 14 years, distributed in five centres in England and Scotland, participated in the test. They were taken by classes and divided at random into four groups, the first of which received biscuits of very low nutritive value, the second one-third of a pint of pasteurized milk, the third two-thirds of a pint of pasteurized milk, and the fourth two-thirds of a pint of raw milk. The supplements were given during school hours for a year, excluding Saturdays, Sundays, and holidays. At the beginning, at the end, and twice in between, the children were examined medically by specially trained observers. The material for the present report was taken from 6,097 children who attended all four medical examinations, and from 695 who attended the first and second. Briefly, it was found that the milk supplements produced in both sexes, irrespective of age, increments in height, weight, and chest circumference greater than those which occurred in the control group on biscuits. These increases were greater in the groups receiving two-thirds of a pint of milk than in those receiving only one-third of a pint, but the absolute increases were very small. Thus in the boys the average increase in height of the two groups receiving two-thirds of a pint of milk over the biscuit group was only 0.089 inch, and in weight 0.584 lb., while in girls the corresponding figures were 0.088 inch and 0.913 lb. The growth-promoting power of the milk appeared to be exerted mainly in the early part of the test, and contrary to expectation was greater in children who were assessed clinically as above the average than in those who were poorly nourished at the start. Assessment of the posture, the complexion, and the condition of the tonsils, the conjunctivae, and the eyes yielded irregular results, there being a downward shift during the course of the experiment. The committee attributes this to an alteration in the standard of the medical observers. On the other hand, they attach significance to an almost equally subjective test—namely, the general state of nutrition, which was found to rise in the groups receiving milk to a greater extent than in the group on biscuits. Similar weight is given to the greater increase in intellectual capacity among the milk groups during the course of the year as estimated by the teachers. What exactly is meant by intellectual capacity it is difficult to say. If the expression refers to innate intelligence, which is doubtful, it should have been possible to measure it by proper intelligence tests. If mere increase in mental alertness and animal spirits is intended, then the subjective element in assessment comes in again, particularly when it is realized that the teachers, unlike the medical examiners, knew to which group the individual children belonged. On the whole, the results of these various subjective tests are difficult to interpret, and too much stress should probably not be laid on the committee's conclusions.

So far as a comparison of raw and pasteurized milk is concerned, no constant differences could be detected between the growth-promoting effects of the two-thirds of a pint of raw and two-thirds of a pint of pasteurized milk in either height, weight, or chest circumference. The only constant difference that could be established was in muscular strength, as estimated by the dynamometer test, and this was in favour of pasteurized milk. The differences, though uniformly in the same direction, were small, and could not be considered statistically significant. The general conclusions to be drawn from the feeding test on children are that milk has a stimulating effect on growth, and that there is no detectable difference in this respect between raw and pasteurized milk.

Summarizing the experiments on rats, the committee draws the following conclusions. Commercial pasteurization did not affect the total nutritive value of the milk or the availability or nutritive value of the protein, calcium, or phosphorus; it reduced the vitamin C content of the milk by about 20 per cent. and the B complex—presumably the B_1 fraction—slightly, but did not alter the content of vitamin A or of its precursor, carotene. The effect on vitamin D was not tested, but as this vitamin is known to be very resistant to heat it may be presumed that it is not

[1] *Milk and Nutrition: New Experiments Reported to the Milk Nutrition Committee.* Part IV. Price 2s., post free, from the National Institute for Research in Dairying, Shinfield, Reading.

affected by pasteurization. The fall in vitamin-C content occurs only, it will be remembered, when the milk has been previously exposed to light. Pasteurization of milk drawn into and kept in opaque vessels free from copper has no effect on vitamin C. The calf-feeding experiments again failed to reveal any significant difference between the nutritive value of raw and pasteurized milk. In relation to the observations on children and calves, it may be argued that there were defects in the pasteurized milk, but that they were neutralized by other foods. The committee's answer to this is that it is not small defects which are important but only those which become manifest under strictly practical conditions. Such defects might be of importance in infants fed purely on cows' milk, but since cows' milk is not a perfect food for infants it is usual now to add iron and vitamin C, even when the milk is given raw. Since the best way of giving iron is in the form of egg-yolk, and since egg-yolk contains in addition vitamin A, carotene, vitamins B_1, B_2 complex, and D, any slight defects in pasteurized milk which might exist would almost certainly be neutralized by this means.

The main result, therefore, of the research work carried out during the past five years by the Milk Nutrition Committee on rats, calves, and children is to show that milk has a stimulating effect on growth and that no detrimental effect of any practical importance is brought about by holder pasteurization. The conclusions of such an authoritative body, taken in conjunction with similar conclusions reached by other independent workers in different parts of the country, will, it is hoped, dispose once for all of the erroneous statement that pasteurization destroys the nutritive value of milk. At a time such as the present, when large numbers of children who have been brought up on pasteurized milk in our large towns are now being fed on raw infected milk in the country districts, the importance of safeguarding their health by adequate heat treatment of the milk cannot be too strongly emphasized. Medical officers who have hitherto hesitated to introduce pasteurized supplies from the neighbouring towns on account of a lingering fear that the nutritive quality of the milk was less than that of raw milk may take courage from the fact that such a fear is entirely without scientific foundation.

RECENT WORK ON VITAMIN C

Research on the physiological action of ascorbic acid and on the daily requirement by the human being continues. In the past there has been much contradictory evidence on the reserve of vitamin C in the human foetus and placenta. According to the latest work of Muller[1] on fourteen animals (cow, pig, horse, man) the vitamin-C content of the liver of the foetus was, with one exception, equal to that of the liver and placenta of the mother. There was no evidence of a synthesis of vitamin C in the foetus, which received it from the blood stream through the placenta. Winkler[2] has found in rabbits a fluctuation in the amount of ascorbic acid excreted daily during the first few days of pregnancy, a steady slow rise till the fourteenth day, and then a more rapid decline till the day before parturition, when the amount excreted rose; on that day and on the day of parturition it was very large indeed. On the succeeding days it fell to normal level. Winkler concluded that the ascorbic acid was retained as an activator of the hormones needed during pregnancy, and when no longer required for this purpose it was excreted. Snelling and Jackson[3] have demonstrated a slight fall in the ascorbic-acid content of blood plasma towards the end of pregnancy, and a higher content of ascorbic acid in the foetal blood than in the maternal blood just before parturition. They advise giving extra vitamin C to a breast-fed infant if the mother's milk does not contain at least 2 mg. per 100 c.cm. A level of ascorbic acid lower in prematurely born than in full-term newborn infants was observed by Steinebrei,[4] but whether this was normal for such infants or slightly pathological he did not know. The mothers of the infants examined were almost all from the peasant class. Examining the vitamin-C content of different regions of the brain Diehl and Neumann[5] discovered that the parts with the lowest vitamin-C content were those having no direct relation to the vegetative functions—for example, the cerebrum, cerebellum, and corpus callosum. On the other hand, vital centres contain a large store of vitamin C. That these differences were not found in the brains of infants is understandable when it is realized that at birth the vegetative centres are already fully developed, whereas the "higher" centres do not mature until later.

All growing tissues require large supplies of vitamin C. Diehl and Kirchmann[6] observed that the rise in blood sugar of a patient taking 100 grammes of glucose by mouth was greater after high dosage with vitamins B and C than after no vitamin therapy. They believe that the water-soluble vitamins are necessary for the normal functioning of the glands of internal secretion. Injections of large amounts of vitamin C followed by smaller daily doses were found by Papayanopulos and Schroeder[7] to produce a rise in the thrombocyte count up to 450,000 and 530,000 per 100 c.cm. of blood in two patients. They believe, however, that this is due to a stimulation of the bone marrow and not to the "vitamin character" of the ascorbic acid. Reporting the beneficial effects of big doses of vitamin C on

[1] *Klin. Wschr.*, 1939, **18**, 299.

[2] *Klin. Wschr.*, 1939, **18**, 372.
[3] *J. Pediat.*, 1939, **14**, 447.
[4] *Klin. Wschr.*, 1939, **18**, 489.
[5] Ibid., 418.
[6] Ibid., 422.
[7] Ibid., 428.

patients suffering from lead poisoning Holmes, Amberg, and Campbell[8] consider that it unites with the toxic lead ions to form a poorly ionized and much less toxic compound which is probably absorbed by the liver and passed into the bile, for it is found in the faeces, as is the lead compound formed during "de-leading" with potassium iodide. It has been claimed that large amounts of ascorbic acid lessen the anaphylactic shock resulting from the injection of antitoxic sera into susceptible persons, but Szirmai[9] has been unable to confirm this. He injected 0.1 c.cm. of solutions of 50 to 150 mg. of ascorbic acid in 1 c.cm. horse serum into sensitized animals. The effect of this was not different from that of horse serum alone. Meyer[10] has extracted ascorbic acid from human and ox tonsils and identified it by its melting-point, crystalline form, and two microchemical reactions. The amount in the tonsils was raised by giving large doses of the vitamin, and Meyer claims that it stops the growth of pneumococci and streptococci and apparently raises the phagocytosis value of human blood. It is therefore one of the factors necessary for resisting infection. According to Zacko[11] the capillary resistance of the skin of scorbutic guinea-pigs was nearly restored to its normal level by ascorbic acid and completely restored by citrin. Intestinal haemorrhages disappeared when citrin was added to the diet, but it did not prevent the death of scorbutic guinea-pigs, nor did it make them live any longer than the negative controls. His citrin was prepared from rose-hips.

An average ascorbic-acid content of the blood serum of 0.22 mg. per 100 c.cm. of blood in the spring and 0.9 mg. in the summer was found in 326 healthy persons by Dagulf.[12] In the spring 94 per cent. of his subjects had less than 0.5 mg., the amount usually regarded as necessary for health. He concluded that the figure 0.5 mg. per 100 c.cm. of blood is too high for the Swedish people and probably also for the whole of the Scandinavian population. Of 255 tuberculous patients whom he examined and whose vitamin-C intake during the greater part of the year was not over 30 mg. per man per day, the average was 0.1 mg. per 100 c.cm. of blood in the spring and 0.47 mg. in the summer. Yet during the last twenty-five years the mortality rate from tuberculosis in Sweden has dropped 50 per cent. Neuweiler[13] has concluded from many examinations that 30 to 35 mg., or preferably 50 mg., of ascorbic acid should be taken daily by the healthy adult, but in special circumstances—for example, sickness and pregnancy—this should be increased to 60 to 70 mg. He also believes that the other constituents of the diet—for example, fatty acids and vitamin D—influence the amount of vitamin C required. Goldsmith and Ellinger[14] consider that the renal threshold value of reduced ascorbic acid is 1.4 mg. per 100 c.cm. of blood. They suggest that the significance of a partial depletion of the ascorbic-acid content of the body in disease should not be overrated, as mild vitamin-C deficiency is extremely prevalent in apparently healthy individuals. Stepp and Schroeder[15] contend that individuals vary greatly in their requirements for vitamin C, and that the higher the metabolism (as in growth, exercise, and pregnancy) the more is the need for the vitamin. According to these workers the amount necessary to keep a person in really robust health is very much greater than that for the prevention of signs of avitaminosis, and they think that an intake of as much as 300 mg. ascorbic acid a day is desirable. Thus all evidence tends to show that it is almost impossible to take too much ascorbic acid and that there is a real danger in taking too little.

[8] *Science*, 1939, **89**, 322.
[9] *Arch. Kinderheilk.*, 1939, **117**, 56
[10] *Klin. Wschr.*, 1939, **18**, 704.
[11] *Acta path. microbiol. scand.*, 1939, **16**, 144.
[12] *Klin. Wschr.*, 1939, **18**, 669.
[13] Ibid., 769.
[14] *Arch. intern. Med.*, 1939, **63**, 531
[15] *Klin. Wschr.*, 1939, **18**, 414.
[16] *British Medical Journal*, 1937, **2**, 709; 1939, **1**, 396; 1939, **2**, 733.
[17] *Lancet*, 1939, **1**, 1088.
[18] *Surgery*, 1939, **6**, 398.

THE CLEANSING OF WOUNDS

There is an unsatisfactory lack of uniformity in the methods employed for preventing wound infection. This applies as much to methods for clean operation wounds as to those employed in accidental injuries presumed to be infected. Not only are many different reagents used for pre-operative disinfection of skin, but proposals have recently been made for protecting the wound against contamination from sources other than the patient's skin during the course of the operation. We have referred previously[16] to Hart's device for irradiating the field of operation with ultra-violet light. This method is based on the assumption that post-operative suppuration in what should be clean wounds is due to their contamination by staphylococci from the air, these staphylococci being supposed to originate in the throats of the theatre staff. Apparently quite inconsistent with this hypothesis were the results of very detailed observations by Devenish and Miles,[17] who not only found that the numbers and rate of deposition of pathogenic staphylococci in the air of an operating theatre were so small as to constitute an almost negligible risk, but showed that an admittedly exceptional series of post-operative wound infections was due to contamination from the surgeon's hands through minute glove perforations. Another much simpler proposal[18] for obviating this risk is now made by R. H. Jackson and R. H. Jackson, jun., who also take it for granted that the air is the source of these infections, and, indeed, present some evidence of their own to this effect, obtained by suspending open plates of culture media above the field of operation: these yielded growth including staphylococci and haemolytic streptococci after three hours' exposure, but neither counts nor further species identification were attempted. The procedure advocated by these authors

is simple cleansing of the wound with soap and water before closure. They argue that fragments of blood-clot and fibrinous exudate in a wound "catch and hold bacteria and dust as would fly-paper," and that the mere mechanical removal of these possible foci of bacterial growth is all that is needed. Rough bacterial counts of washings before and after the process appear to show that nine-tenths of the bacteria in the wound are in fact removed. The soap used is said to have little germicidal action, a somewhat surprising fact in view of the known capacity of soap for killing bacteria, particularly the pyogenic cocci. In the authors' hands this method has reduced the frequency of post-operative wound infection from 4 per cent. and often much more almost to *nil*. Its simplicity is certainly a great advantage, and it might well be given a trial in accidental as well as operative wounds. The possible merits of the method are unaffected by any view which may be taken of the usual source of bacteria in operation wounds, but these authors' sweeping statement that "the air of every operating room is practically always badly contaminated with staphylococci and streptococci" can fortunately not be accepted.

EXPEDITION IN G.M.C. BUSINESS

The 150th session of the General Medical Council was probably the shortest in its history, certainly the shortest in the recollection of any of its present members. A body sometimes accused of dilatoriness disposed of eight disciplinary inquiries in three hours, during which time, after due consideration, it erased the names of three practitioners from the *Medical Register* and decided that the other five should remain. It is true that most of the cases arose out of police court proceedings for drunkenness and cognate offences, in which it is necessary to do little more than prove the convictions and hear any mitigating plea the respondent may make; but there was one charge of conspiring unlawfully to procure miscarriage, and another of committing adultery with a patient, both the practitioners concerned being struck off. A decision which marked a departure from the usual procedure was the erasure of the name of a practitioner against whom three convictions (two for being in charge of a car whilst under the influence of drink and one for being drunk and disorderly) had been recorded in 1937 but none since, and he had been for two years on probation. The reason which actuated the Council in arriving at its decision may have been the neglect of the respondent to give the usual assurances as to his future behaviour, but the case may indicate a stiffer line in dealing with charges of drunkenness. The Council showed an equal celerity over its educational business, which occupied less than an hour. It was stated on the agenda that the Council would receive oral reports from the chairmen of two committees *in camera*. The chairman of one of these committees gave his report in public in one of the most entertaining speeches ever heard in the Council, but at its conclusion another member "spied strangers," and after the question of the exclusion of strangers had been considered *in camera* the Press and public were recalled and asked to turn a deaf ear to what had so far occurred. To make up for the lapse of taking a report in public which should have been taken in private the Council took a report in private which should have been taken in public. This was the report of the Pharmacopoeia Committee, which presumably recommended the appointment of Professor J. A. Gunn as the new chairman of the Pharmacopoeia Commission. It would be a pity if, as happened on this occasion, all the business of the Council except its disciplinary inquiries were to be taken behind closed doors. The Council at this session was crowded into the small chamber of the Dental Board to avoid the difficulties of blacking out its own large chamber, but the speed with which the business went through was such that the precaution proved wholly unnecessary, and the only "black-out" was in the Press gallery.

IS LEUKAEMIA A NEW GROWTH?

Last year we reviewed Forkner's important monograph on leukaemia and allied disorders in man,[1] and this may be supplemented with profit by Engelbreth-Holm's review[2] of the results of research on leukaemia in recent years. No further advances have come from the clinical study of the disease apart from some improvements in the classification of leukaemia and the differential diagnosis, the latter due mainly to the introduction of sternal puncture and to some extent to routine *x*-ray examination of the bones in obscure anaemias. The prognosis remains uniformly hopeless, and the newer radio-active substances prepared with the cyclotron do not offer any great promise of superiority over thorium, radium, and *x* rays. Nor are technical changes such as the use of general rather than localized irradiation likely to be revolutionary. The well-known observation that local irradiation of the spleen, even with very small roentgen doses, produces a striking change in the condition in leukaemia offers a problem that still awaits solution. Clinical observation strongly suggests that leukaemia is a form of new growth. There is every transition from classical leukaemia to tumours such as chloroma and lymphosarcoma. The metabolism of the leukaemic cells and the morphological abnormalities they show are identical with those of neoplastic tissues. The diffusion of the lesion is a consequence of the diffuse location of the blood-forming organs and their lack of fixity as tissues. Moreover, it can be paralleled in quite different tissues, and Engelbreth-Holm gives such examples as neurofibromatosis, multiple primary cancer of the lungs, bilateral suprarenal tumours, and multiple carcinoma of the small intestine. If clinical observations allow us only to presume that leukaemia is a form of new growth, the observations on experimental animals amount almost to proof. Spontaneous leukaemia has been observed in most vertebrates, including the common domestic animals, but because of the high incidence and the ease of transference it has been most closely studied in the fowl and the mouse. The predisposing factors appear to be heredity, external environmental factors (irritation), and a virus. About

[1] *British Medical Journal*, 1938, **2**, 621.
[2] *Ergebn. inn. Med. Kinderheilk.*, 1939, **56**, 267.

twenty-five human families are known in which more than one case of leukaemia has been observed in near relatives. It is striking that twenty-two out of the twenty-seven cases collected by Petri were lymphatic in type, whereas on the average lymphatic leukaemia constitutes only 30 per cent. of all cases of leukaemia. It seems certain, therefore, that the familial incidence of leukaemia is more than a coincidence. Pure strains of mice have been bred in which the spontaneous incidence of leukaemia reaches 90 per cent., while in other strains leukaemia has been bred out so that its incidence is little over 1 per cent. Experiments in which after roentgen irradiation the spontaneous incidence of leukaemia in a strain rose from 2 to 20 per cent. indicate with absolute certainty that uninherited external factors also play a part. In the strains in which 90 per cent. of the mice succumb to leukaemia the remaining non-leukaemic animals apparently owe their freedom to external factors, for they transmit the leukaemic disposition to their descendants in as high a proportion as the mice which die of leukaemia. External agents known to produce or to increase the incidence of leukaemia in animals are radium and *x* rays, tar, and the carcinogenic hydrocarbons. A number of human cases have been published which suggest an increased incidence of leukaemia in men and women, such as radiologists and physicists, whose occupation repeatedly exposes them to radiation. In the fowl many of the spontaneous leukaemias can be transmitted to healthy birds by cell-free filtrates. This is probably a phenomenon of a different character from the induction of leukaemia by physical or chemical irritants. The virus acts much more rapidly and it is reproduced during the growth of the cells, which does not happen in the case of the carcinogenic hydrocarbons. Several groups of investigators have reported independently of each other on leukaemic strains in fowls where one and the same filterable agent can produce both leukaemia and sarcoma. In Engelbreth-Holm's strain intravenous administration of the agent was usually followed by the development of leukaemia, while subcutaneous or intramuscular application of the same agent more commonly induced fibrosarcoma. Although leukaemia in mice can be implanted from one animal to another it cannot be transmitted by a cell-free filtrate, but recent experiments suggest that cell-free transmission is not beyond the bounds of possibility and that there is no fundamental difference between leukaemia in birds and in mammals.

ACTIONS OF VERITOL

During the last few years a number of sympathomimetic amines have been introduced for clinical use as analeptics. In this group is the compound veritol, the chemical name for β-para-oxyphenylisopropyl methylamine, which has been the subject of a number of favourable clinical reports; but the exact nature of its pharmacological action has been a matter of controversy. Veritol causes a prolonged rise in blood pressure, and some authors have attributed this to vasoconstriction and others to increased cardiac output. Drs. Pona and Muratori,[1] in an investigation of this problem among normal persons and persons suffering from cardiac and other diseases, found in all cases a rise in systolic pressure accompanied by decreased cardiac frequency. Blood volume increased in the majority of cases, presumably because of the emptying of blood stores such as the spleen. Analysis of the individual responses, however, showed no certain relation between the extent of the rise in blood pressure and the increase in the blood volume. In those cases in which there was no increase in blood volume there was nevertheless a rise in blood pressure. This latter, the authors concluded, was due to at least three factors: a direct cardiac action, vasoconstriction, and increase in blood volume by mobilization of the blood stores. The action of veritol on the circulation is, therefore, complex, but the rise in blood pressure without increase in the heart rate is an important clinical feature.

HOSPITAL FUND FOR THE PROVINCES

Lord Nuffield announced on December 5 in a letter to the Minister of Health his intention to place in the hands of trustees a million share units of Morris Motors Ltd. to encourage the development of hospital regionalization outside the metropolitan area on the general lines laid down by the Sankey Commission on Voluntary Hospitals. These shares (now worth about £1,250,000) would be the nucleus of a central hospitals fund for the Provinces; in the London area there already exists in the King's Fund a central authority for the co-ordination of hospital finance and policy. Lord Nuffield hopes that through the new fund for the Provinces and the King's Fund in London there will ultimately emerge a truly national hospital service, "which will embrace all that is best of both public and voluntary effort with the maximum of economy to the State and to the private purse." This project already has the warm support of the Provisional Central Council of the British Hospitals Association, and the Minister of Health in expressing deep appreciation of Lord Nuffield's munificence and public spirit welcomes the conception underlying his proposal —"the conception of a co-ordinated hospital system which will look to the needs of the country as a whole and will cover as far as possible appropriate regional units." He agrees with Lord Nuffield that the Local Government Act, 1929, can rightly be taken as laying the statutory foundation of the conception.

For the time being the British Medical Association will continue the publication of its special journals, the *Archives of Disease in Childhood*, the *Journal of Neurology and Psychiatry*, and the *British Heart Journal*, and contributors are asked to send their papers to the editors of these journals at the following addresses: Dr. A. Moncrieff, F.R.C.P., The Middlesex Hospital, London, W.1; Dr. E. A. Carmichael, F.R.C.P., Hurstwood Park Hospital, Haywards Heath, Sussex; Dr. J. M. H. Campbell, O.B.E., F.R.C.P., Orpington War Hospital, Orpington, Kent.

[1] *Acta med. scand.*, 1939, **101**, 465.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

INJURIES OF THE SEMILUNAR CARTILAGES—I

BY

A. G. TIMBRELL FISHER, *M.C.*, F.R.C.S.

Injuries of the semilunar cartilages are somewhat frequently encountered in practice, and their prompt recognition and effective treatment are of considerable importance. There is probably no subject which is more apt to cause damage to the practitioner's reputation or to present the osteopath or bone-setter with a gratuitous advertisement.

Definition and Pathology

The term "displaced cartilage," although often used, is perhaps misleading, as in the great majority of cases a definite fracture of the cartilage occurs, and the most striking symptoms are due to the behaviour of the fractured portion and not to displacement of the whole cartilage. Hypermobility of a semilunar cartilage without actual fracture may be present under certain conditions, but is much rarer than is sometimes stated. The types of fracture are very varied, but longitudinal cleavage, either complete or incomplete, occurs most frequently (47.54 per cent. in my series). The complete longitudinal fracture is often called the "bucket-handle" type (Rutherford Morison). Next in order of frequency are fractures involving the anterior (27.86 per cent.), posterior (13.93 per cent.), and middle thirds. Injuries of the internal semilunar occur most frequently. The proportion of external semilunar injuries ranges in published statistics from 7 per cent. (Sir Robert Jones) to 20 per cent. (my figures) and even 28.4 per cent. (Dunn).

Mechanism of Semilunar Cartilage Injuries

In flexion and extension of the knee, and when the femur forms the fixed and the tibia the movable arm of the lever, the semilunar cartilages remain in contact with the upper surface of the tibial head but move slightly forwards in full extension and slightly backwards in full flexion. When the tibia is the fixed arm of the lever, as in certain stages of walking or running, the femoral condyles roll and glide over the upper surface of the tibia and semilunar cartilages. Rotatory movements, which are possible when the knee is flexed, take place on the inner side principally between the internal femoral condyle and the internal semilunar cartilage; but on the outer side a good deal of the movement occurs between the external semilunar cartilage and the tibia, and the cartilage moves to a great extent with the external femoral condyle.

The deep fibres of the internal lateral ligament are firmly attached to the inner convex surface of the internal semilunar cartilage just behind its centre. This ligament normally assists in preventing excessive rotation inwards of the femur upon the fixed tibia or external rotation of the tibia upon the fixed femur. A sudden rotation inwards of the femur upon the fixed tibia with the knee in partial flexion may cause a rupture of some of the deep fibres of the internal lateral ligament, and a sprain results.

When the ligamentous injury is of a more serious nature the inner side of the joint is opened up, permitting the internal semilunar cartilage to move to a variable degree towards the centre of the joint and, in a continuation of the rotatory movement, the cartilage is ground between the internal condyles of the femur and tibia. Actually, of course, this combination of events takes place in the fraction of a second. The internal semilunar cartilage is thus subjected to both compression and torsion strains and various types of lesion result, particularly the bucket-handle type and lesions of the anterior portion. The bucket-handle lesion is more likely when abduction is a well-marked feature.

This combined form of strain explains the peculiar shape of the fractured surfaces, which often overlap like the approximated blades of scissors. If, however, the attachment of the internal semilunar cartilage to the deep fibres of the internal lateral ligament remains intact this portion acts as a hinge, and the anterior part of the cartilage may be torn, or various forms of tear may occur opposite the fixed portion of the cartilage. Injury to the posterior end of the internal semilunar and some types of bucket-handle lesion are probably caused by forcible external rotation of the femur upon the fixed tibia when the knee is slightly flexed, or, conversely, by internal rotation of the tibia upon the fixed femur. These movements are also probably responsible for injuries of the anterior portion of the external semilunar cartilage. Injury to the posterior portion of the external semilunar cartilage is probably due to internal rotation of the femur upon the fixed tibia, and vice versa, and buckle-handle lesions of the external semilunar to either mode when adduction is prominent.

Signs and Symptoms

There are two principal modes of onset. In the first and most common the early symptoms are severe, and any recurrences tend to become more frequent but associated with less reaction. In the second, symptoms are slight at first but gradually become more definite, until locking occurs, when the onset of the first class is simulated and a similar sequence of events follows. In the first class the patient experiences acute pain, usually more severe over the affected cartilage, and may fall to the ground. Mechanical locking often occurs, and usually takes the form of an immediate inability to straighten the knee completely. It is sometimes very difficult at the time of the original accident to distinguish between this mechanical block to extension and the limitation due to muscular spasm, which is always present in any acute injury to the joint. In some cases of injury to the posterior part of a semilunar cartilage there may be a mechanical block to full flexion. Tenderness over the semilunar cartilage is experienced, its position depending upon the site of the injury. Synovial effusion ensues rapidly in severe injuries and more slowly in the less severe types. In the former the effusion is largely haemorrhagic.

In the second class there is usually a history of recurrent attacks of pain with or without effusion or of "giving way" of the knee before true locking occurs. It is probable that in this class the attachments of the cartilage are gradually stretched and a certain amount of hypermobility of the cartilage precedes the actual fracture. In recurrent cases a history of attacks of mechanical locking or sudden "giving way" of the knee is important, and physical signs between attacks may be few. Tenderness over the semilunar cartilage can frequently be elicited, together with cartilage crepitus on deep palpation. McMurray's test is sometimes positive, and there is often a certain amount of synovial effusion and wasting of the quadriceps extensor. Radiography gives no clear guidance in semilunar cartilage cases; but this should never be omitted, since by means of it we can ascertain whether some coincident condition, such as fracture of the tibial spine, loose or foreign body, osteoma, or osteo-arthritis, is present.

Treatment of the Original Injury

This should be carried out on the following lines: If locking is present the displaced portion of the cartilage must be replaced by manipulation without delay. This is followed by rest from weight-bearing until the acuter symptoms have subsided, combined with firm bandaging of the joint over a thick layer of wool. The use of strapping, plaster-of-Paris, or splintage is not advised, although the purely temporary use of a back-splint may be necessary if the patient is restless. Physical treatment in the form of radiant heat, massage of the limb, and careful active movements is instituted from the first, and, provided all rotatory movement is avoided, is of value in aiding the absorption of traumatic effusion, in alleviating pain and spasm, and in preventing adhesion formation and muscular wasting. In the absence of locking, this treatment (which closely resembles that for a severe sprain of the knee) is begun at once. In an average case, when the acuter symptoms and synovial effusion have appreciably diminished, a little walking may be allowed, the compression bandage being still worn. Physical treatment in the form of massage and re-educational exercises for the thigh muscles is continued and steadily increased, although all rotatory movements must be avoided.

MANIPULATIVE TECHNIQUE

The replacement of the fractured portion of the semilunar cartilage may be easy or, in cases such as some varieties of the complete bucket-handle type and when the displacement has remained unreduced for several days or weeks, extremely difficult. Replacement without the aid of anaesthesia is quite possible, but it is made more difficult by associated muscular spasm and is a painful procedure; an anaesthetic is therefore advisable. Gas or gas-and-oxygen, if skilfully administered, usually suffices in early cases. Intravenous evipan or pentothal is a valuable alternative, but should not be given in the surgery or the out-patient department, admission to nursing home or hospital for a short period being desirable. If the cartilage has remained unreduced for some time ether or chloroform may be necessary.

Method 1 (Figs. 1, 2, and 3).—The patient lies upon his back on a couch or operating table. Assuming that we are dealing with the internal semilunar cartilage of the right knee, the practitioner grasps the sole of the patient's right foot with his right hand and the affected knee with his left hand. He first fully flexes the knee and, while abducting to open up the inner side of the joint, rotates the tibia inwards and outwards. This movement may be repeated with the knee flexed to 90 degrees. In some cases the mere movement of flexion reduces the displaced portion, but usually this takes place during rotation or during the final movement. This consists in a rapid movement of extension accompanied by internal rotation. In the case of the external semilunar cartilage the outer side of the joint must be opened up by adducting the

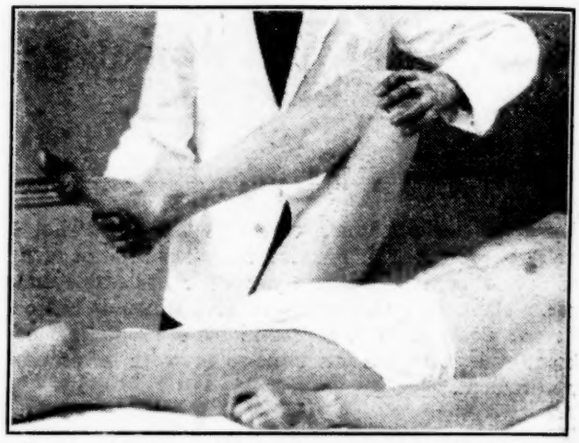

FIG. 1.—Method 1. Manipulation of right knee for fracture-dislocation of internal semilunar cartilage. Stage 1: Full flexion.

FIG. 2.—Method 1, Stage 2: Rotation combined with abduction.

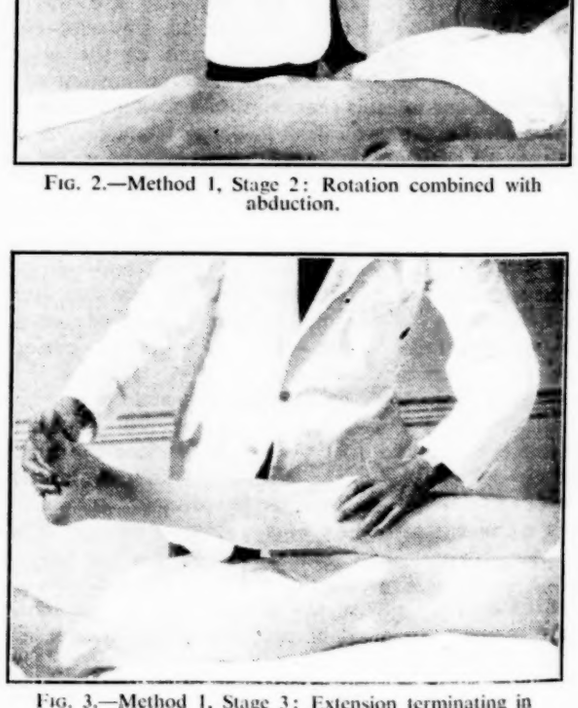

FIG. 3.—Method 1, Stage 3: Extension terminating in internal rotation.

leg, and the final movement is one of extension combined with external rotation.

Method 2 (Fig. 4).—The above method usually succeeds in original cases of average severity. When it fails a more effective method of abducting or adducting the

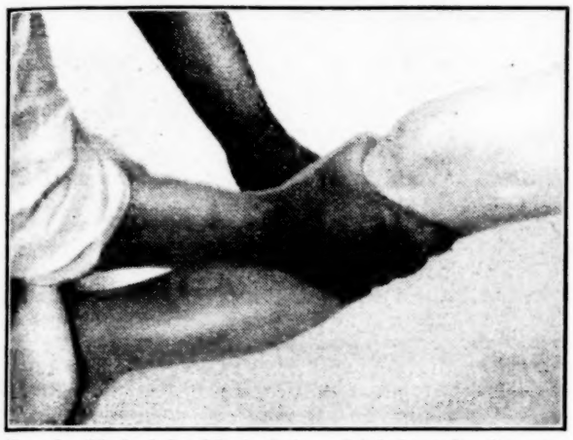

FIG. 4.—Method 2. Manipulation of left knee for fracture-dislocation of semilunar cartilage.

joint and bringing about the necessary rotation should be tried. In the first method described above it is a disadvantage that the abducting and rotating forces are not applied directly to the tibia. The following method overcomes this difficulty, and once the technique is acquired it is extremely effective. In fact, I have often reduced displacements by this means without an anaesthetic when previous attempts elsewhere under anaesthesia have failed. The patient either sits in a chair or lies with the leg hanging over the end of the operating table. The practitioner grasps the upper end of the patient's leg just below the knee with both hands and grips the patient's foot between his thighs. The knee is first flexed through 10 to 15 degrees, and in the case of the internal semilunar cartilage he strongly abducts the joint with his thighs, aided by his hands. Then with the knee in partial flexion and well abducted a very strong movement of external or internal rotation is communicated to the tibia by the practitioner's hands. Replacement is usually accompanied by an audible "snap" which is quite characteristic. The knee should then be extended, particular attention being paid to the "screw-home" movement at its termination, and if the manipulation has been successful this movement should be full and free. The most satisfactory test of reduction, however, is that the patient can forthwith perform the movement of full extension either painlessly or with a minimal amount of pain. This is an important sign, and if active extension is still restricted and painful the displacement has not been rectified. After reduction a firm compression bandage should be applied and the after-treatment described above should be carried out.

THE QUESTION OF EARLY OPERATION

The treatment by manipulation and suitable after-treatment of every original injury of a semilunar cartilage associated with locking has been described. It must be clearly borne in mind, however, that in a somewhat high percentage of cases the original displacement is followed by recurrences, particularly when delay in replacement has occurred and when the lesion has been a serious one. This fact should be explained to the patient, and in view of the extremely satisfactory results following removal of the damaged semilunar cartilage by an experienced surgeon it may well be that the future will see earlier recourse to operation in certain cases. For example, I was asked to see an international association footballer who severely damaged a semilunar cartilage in the first match of the season. Locking was present, and as this player was a "key" man in the team immediate removal was advised. This, however, was declined by the authorities and manipulation only performed. This was followed by the appropriate after-treatment, and six weeks elapsed before the player was able to take the field. Shortly afterwards the knee broke down again, and I was then asked to remove the offending cartilage. A further eight weeks elapsed before the player was able to resume, so that for the greater part of the season he was incapacitated. If the original advice had been taken the player would have been available for the cup final, and, owing probably to his absence, the cup was won by a rival club. Many managers of football teams now insist on early operation. Every case must, however, be treated upon its own merits. Patients are not all professionals engaged in strenuous and exacting forms of exercise, and in most cases manipulative replacement of the original semilunar cartilage injury associated with locking appears to be at any rate the best short-term policy.

REGIONAL HOSPITAL ORGANIZATION

[FROM A CORRESPONDENT]

In planning for the future there are two distinct lines, followed according to individual temperament. In the one case will be set down what seems to be an ideal plan for providing what is needed. In the other case attention is first and chiefly given to the existing factors, and the question asked is how they may be brought to the state of efficiency required. The history of successful planning is on the side of the second method: existing factors are stubborn elements in any situation, and have a way of taking their revenge if neglected.

Recent Hospital Planning

In the last thirty years several plans of hospital organization have been worked out and offered to the British public. Some of these have made no reference to existing establishments; some have been based upon one existing system and have disregarded others. As the problem is how to produce a system out of our own resources an examination of these resources is surely the first step towards laying our plans. Certain people would, however, have us treat our resources as indefinite, if not infinite. Some among these would scrap the present controls, and therefore their experience, and start anew with a National Control, which for their argument they assume would exercise its powers at least better than any of the present controlling bodies, if not perfectly. It does not need a training in logic to realize that such taking of something as given which is not given robs a scheme of what every sound scheme needs—namely, a foundation in experience.

The efforts which have in fact produced hospitals in this country have been of two sorts—those of people who, in communities small and large, have combined to establish and maintain out of their own pockets the hospital their community needed; and those of people elected to govern, in Parliament and local councils. Efforts of the first sort have been made and sustained in London for centuries, and elsewhere for generations, and have been partly medical, partly lay. Here and there by this means we are still able to build and equip and maintain hospitals

which are the equal of any in the world; but over the country generally there is difficulty in maintaining the "voluntary" hospital, and, having regard to the sources from which its finance has been derived, these difficulties are likely to increase. Efforts of the second sort culminated in the Bill of 1929, which required counties and county boroughs to administer the Poor Law hospitals transferred to them, and empowered them to extend and develop these hospitals, outside the Poor Law.

Those who are willing to base their plans on the actual factors in a situation and on calculated probabilities are likely to accept the estimate that, in general, the financial resources of those who have built and supported voluntary hospitals in the past have been diminished by taxation and are likely to be further diminished. It would be imprudent and improvident to turn a blind eye to this fact. Its consequence is obvious enough. People cannot be forced to provide "voluntarily" and cannot be persuaded to do what they are unable to do; in general the share in providing hospital treatment taken by the donation-and-subscription-supported hospitals will diminish, that taken by the hospitals provided by public funds will increase. The reaction to this probability of some of those who are interested is to declare that "the voluntary hospital system must be maintained at all costs." A system can be maintained by legislative regulation or by persuasion. Persuasion will not enable men to do what they cannot do; legislative regulation means here superseding the financial foundation of the voluntary hospital system by another.

The Public Hospital

Does legislative regulation of the British hospital system mean that "all is lost," as some would have us believe, that the best and most distinctive features of our treatment principles will thereupon disappear? The answer "Yes" is based on an assumption that has no validity—the assumption that these best and distinctive features cannot be displayed in a system provided by public funds. Medical opinion is divided on this question; the uncompromising "Yes" has come chiefly from those who represent the lay management of the voluntary hospital. They base their argument on the fallacy that the public hospital must be taken as it is at present, and cannot be improved to incorporate the best features of the best of the voluntary hospitals to-day. This fallacy can only be entertained by those who disregard their own and the public hospitals' history.

An example of the kind of argument that is used is as follows. The method by which medical appointments are made to hospital posts in the voluntary hospitals is one that ensures that the best men only will be appointed. They are chosen virtually by their colleagues, and the critical judgment of their colleagues is the best available. Accepting this view as correct, history does not show that this "ideal" method is inherent in the voluntary system, nor is it universal in this system to-day. A generation ago a man who was a candidate for an honorary post in a voluntary hospital sent his application to, and canvassed, the "governors," who might number several hundreds. The plan was improved when "electoral bodies" were substituted for the general mass of governors; but, even so, a candidate could not afford to abstain from canvassing, although this could only be indirect. Admitting that the more instructed selection of to-day is still better than this, the history of the change proves nothing more than that methods of selection can be improved. What it certainly does not prove is that the defects that may exist to-day in the system of appointment in the public hospitals are incapable of removal and must be considered unalterable. All the main arguments of the "all is lost" attitude of the voluntary hospital lay supporter are similarly based. He assumes that the county and county borough hospital system, which is ten years old, has stopped growing and that its ability to learn has come to an end.

The "Voluntary" System

General medical opinion would catalogue the following as among the virtues of the "voluntary" system:

(*a*) *Regional Organization.*—The voluntary system was organized regionally, though in a somewhat haphazard fashion, and no serious barriers prevented patients from going to the hospitals and the men best able to deal with their complaints. It must here be remarked that the regional pattern has been less in evidence since the 1914–18 war than before. Attempts at self-sufficiency on the part of small provincial towns and a reluctance to allow patients to travel have been characteristic of the period, show no sign of diminishing, and are not guided and controlled. The voluntary institutions of many small centres have attempted this self-sufficiency, and co-ordinated regional effort is to-day conspicuously absent. The result is waste, failure, and misdirection. On the other hand, no one who cares to talk with responsible members of council hospital committees and with medical officers of health will be ignorant of the fact that they look upon regional organization as a course upon which they are already set, and expect the Ministry of Health to help them in developing it. Considerable progress along this line has already been made by the London County Council; there is good reason to hope that provincial regions will be able to follow.

(*b*) *Contact between Patients and Hospital Medical Officer.*—Contact has been personal and close because the patient and his doctor chose the hospital officer who should be consulted. With the development of out-patient clinics in the public hospitals a start has been made in many which encourages this personal contact, and there is nothing in the administration of these hospitals which prevents this contact being maintained when the patient enters on his convalescence.

(*c*) *Facilities for Teaching and Training the Medical Student.*—There are those who plan to confine the teaching of the student to the "voluntary" hospital. It may well be asked, Is this done in the interest of particular institutions or in the interest of medical education? If it is desirable that the medical student should be given as wide a clinical view as he can digest, if it is desirable that he should see the commoner complaints as well as the rarer, then the advantages attached to taking him into the public hospitals cannot be denied. Indeed, these advantages have been widely recognized by teaching staffs already. They are so obvious that neglect of the opportunity must come under suspicion of being interested—that is to say, dictated by some consideration or scheme which is not primarily based upon affording the student the maximum of practical clinical culture.

The Policy of the Medical Profession

The amount of financial support that is at present being afforded to the voluntary hospitals, and the amount which they may expect, vary much from one town to another, from one part of the country to another. If in one place the signs are not such as to lead reasonable judgment to believe that new buildings and increasing income will be forthcoming, wherein does wisdom lie for the medical profession? Does it lie in the leaders of the profession keeping themselves apart from the public hospital, maintained on Government order, and with all the substance of a City Corporation supporting it? Only wishful thinking will deny that development and extension of service on the part of the public hospital is the prospect. Is it too much to say that only wishful thinking will imagine the maintenance of a parallel system, alongside but apart? Who will maintain it? The Government? Apart from what has been created and is being maintained by its own order?

But upon what fundamental idea will the Government proceed? Will not this be, and must it not be, the providing of hospital treatment for the people? Unless it can be shown that the "virtues" of the old voluntary system cannot be introduced into the public system there is no

argument for maintaining a parallel system apart from the latter, and medical teaching and clinical research will have to adapt themselves to the unified hospital order. The expectation of those who look for a second system maintained apart, for the convenience of a teaching staff and under special governance, is likely to be disappointed. The medical profession need lose nothing in any given area by this change if it opens its eyes to what is occurring and plans its policy accordingly. If it shuts its eyes and delays, holds on to expectation of some financial *deus ex machina*, who will intervene to maintain the existing state for some secondary and subsidiary reason, then it will make a mistake that will be difficult to retrieve and lose a chance which may be hard to recover.

A public hospital system, regionally organized by a Ministry of Health, with Government support for teaching and research, is a prospect that need dismay no one, least of all the doctor who determines to do what he can to bring into it the traditions of personal intimate service to the patient that have been characteristic of British medicine. In these days of an Emergency Medical Service there is an opportunity of doing this that should not be missed.

THE STATE OF THE PUBLIC HEALTH

SIR ARTHUR MacNALTY'S REPORT

The Chief Medical Officer of the Ministry of Health deserves sympathy in the circumstances in which his Annual Report for 1938[1] has had to be prepared and presented. It is a narrative of peace-time progress, but it makes its appearance at a time of war which must mean the postponement of many of the plans and aspirations its pages reveal. While the material was being passed for press events—like the German soldiery—had marched. Some parts of the report assume the continuance of peace, others suggest that war is imminent, and yet others—notably the section dealing with venereal disease—that it has already begun. The satisfaction felt in recording progress in so many fields must be seriously qualified by the knowledge of inevitable reaction, the crippling of certain services, the relaxation of certain vigils, the effect of the anxieties, the impoverishments, and, above all, the sheer boredom of war upon the mental and ultimately upon the physical health of the community. Apart from any direct effects of war itself, the evacuation of children and mothers from urban areas must alter the contours of the health picture, for better or worse, perhaps for generations to come.

Emergency Organization

The chapter on emergency medical organization describes only the preparations "should this great calamity befall us," but a footnote has to be added that since the chapter was written the hour has struck and the organization—or disorganization, according to the point of view—has come into existence. In writing of the emergency organization the Chief Medical Officer pays tribute to the voluntary hospitals and their medical staffs for their public spirit in so readily adapting themselves to the new situation. It is emphasized that an important point in the organization is that there should be no interference by the Department in the internal administration of any hospital. The individual hospitals, says the report, are to continue to arrange their own affairs and to be responsible for the treatment of their patients as in peace time, and many of their patients, even in danger areas, will continue to be the ordinary civilian sick. The Ministry also congratulates itself upon its success in obtaining the whole-hearted support of the medical profession and the advice of its leaders and experts in the difficult task of air raid precautions.

1938 was a year of health progress, and despite crises and international preoccupations existing health services were maintained and a new health service, relating to cancer, created. It was a year also of encouraging vital statistics. The death rate for England and Wales was lower than in any previous year except 1930, and the infant and maternal mortality rates and the death rate from tuberculosis were the lowest on record. Of the causes of death, diseases of the heart and circulatory system accounted for 327 out of every thousand deaths at all ages, and malignant disease for 143. If the working period of life be taken (ages 15 to 65), these two conditions retain their places, but the respective numbers are 234 and 182. The reason why the proportion of deaths from diseases of the heart and circulatory system is increasing is largely the growing proportion of older persons in the population. "A young man *may* die, an old man *must* die." Deaths from violence totalled 22,780, and it is worth noting that twice as many men as women committed suicide—3,558 against 1,758.

Prevalence of Infectious Diseases

The number of notifications of diphtheria was 65,000, with 2,931 deaths. Artificial immunization against diphtheria continues to make slow but uninterrupted progress. Its value is undeniable, and not yet sufficiently appreciated by the public. Diphtheria is the principal cause of death among children of the ages of 4 to 10, and is high up in the list of causes in the group aged 10 to 15. It can be said to be the principal killing disease of school age. During the last few years the number of deaths from diphtheria has exceeded the number from measles and whooping-cough, but while no specific remedy has yet been found against these other diseases, with diphtheria it is far otherwise, for there are a number of prophylactics of proved worth, and only the willing co-operation of the public is lacking.

Notifications of scarlet fever numbered just over 99,000, but there were only 359 deaths. The large incidence of this disease, and probably therefore of other forms of streptococcal infection, continues practically undiminished. Deaths from measles and German measles numbered 1,641. Influenza was not epidemic in 1938, but there was a rise in the early part of 1939. It appears, however, that this increased prevalence was irregular in distribution, and that in some communities a substantial portion of the morbidity was due to febrile respiratory catarrh, sometimes of a severe type, and not to influenza. The number of cases of acute poliomyelitis was 1,489, the highest in any year since notification became compulsory in 1912, and the number of deaths was 172. There were eighteen cases of small-pox notified, nine being of the major variety, with one death. Eight cases of acute nervous disease following vaccinations were reported. Six of these were cases of primary vaccination in adolescents or young adults, and furnish additional evidence for the warning repeatedly given by the Ministry that primary vaccinations at school age and in adolescence, except in special circumstances, are to be deprecated.

The great decrease in incidence and mortality of enteric fever in this country is one of the most striking facts in the history of epidemiology. Both cases and deaths were at their lowest in 1938, but it is pointed out that the price of freedom from enteric fevers is constant vigilance, communal and individual. The co-operation of the individual with the community is necessary, for while the incidence of enteric disease may rightly be regarded as an index of the state of sanitary evolution at which the community has arrived, it is no less an index of personal hygiene, for infected persons may convey the causative organism to others by carelessness or lack of cleanliness.

Infants and Mothers

A certain qualification has to be made concerning the fall in the infant mortality rate. (By the way, the number of infant deaths last year, 32,724, was less than one-fourth of the

[1] *On the State of the Public Health.* Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1938. H.M. Stationery Office. (3s. 6d. net.)

number thirty-five years ago.) The fall is due to the reduction of deaths in the later months of the first year of life. The conditions which have caused this fall must either be inoperative in the earlier months, especially in the first month, or must be counterbalanced by other adverse factors. Stillbirths also showed little or no reduction, and the problem of the causation of stillbirths has much in common with that of neo-natal death.

The total mortality from puerperal sepsis was 0.89 per thousand live births, and that from other puerperal causes 2.19, making a total puerperal mortality of 3.08, the lowest on record. The confidential reports received by the Ministry ascribed 1,468 deaths to pregnancy or childbirth and 289 to associated causes, the figures being lower than those given by the Registrar-General. The causes of death were:

Sepsis	293
Haemorrhage	241
Toxaemia	247
Embolism	162
Other causes directly due to childbearing	198
Ectopic gestation	38
Abortion	289
Associated conditions	289

Leaving out the cases of abortion and of ectopic gestation, the delivery in 726 of the fatal cases was in hospital, in 486 at home, and 220 women died undelivered. The nature of the delivery was as follows:

Natural	700
Forceps	329
Caesarean section	163
Craniotomy	32
Other operations	49

Local investigators report that in 622 of the total 1,757 cases there was an assessable avoidable factor, whilst in 630 cases no such factor existed. As to the remainder they express no opinion.

The highest maternal mortality in any administrative county was 8.86 per thousand births in Brecknockshire; the lowest was 1.07 in Cambridgeshire. The highest in a county borough was 7.5 at Chester, and the lowest 0.87 at Croydon.

Extended reference is made to the Ministry's midwifery schemes. In England 169 local supervising authorities under the Midwives Acts have inaugurated domiciliary schemes whereby over 7,000 midwives are employed, either by the authorities themselves or by voluntary associations. Although it is still early days for conclusions, it is claimed that on the whole the standard of practice has been raised. In Wales nineteen local supervising authorities employ 312 midwives directly, while 444 are employed through nursing associations. Medical practitioners are summoned in increasing numbers of cases in Wales; the 20 per cent of notified births in which practitioners were summoned in 1934 became 30 per cent. last year. Apart from the domiciliary midwifery schemes the most noteworthy development in the maternity service is the extension of in-patient accommodation and the provision of new departments. Local authorities in England during 1938 provided or subsidized 9,439 beds at 558 institutions, to which 177,000 patients were admitted.

Cancer and Tuberculosis

The new national cancer service gives special interest to the section of the report devoted to this subject. The total number of deaths from cancer in England and Wales in 1938 was 68,605, and the standardized mortality—meaning the figure after differences solely due to changed constitution of population in regard to age or sex had been eliminated from the crude rate—was 1,005 per million living. It is the deaths of males from cancer which are increasing steadily; the female rate since 1924 has been almost stationary, with an irregular tendency to fall. This may be due to the greater curability of cancer by modern methods as it affects women—for example, carcinoma of the breast and of the cervix uteri. The breast is the most frequent site of cancer in the female, the stomach of cancer in the male. The arrangements made by local authorities under the new service and the objects which the service hopes to achieve are fully set out. The guiding principle should be, says the report, the removal from the path of practitioners and of their patients of those difficulties which tend to prevent the latter from receiving the treatment best suited to their condition and receiving it at an early stage of the disease.

The statistical returns for tuberculosis are again encouraging. The general decline continues and the check to the fall in mortality in young adults which has caused concern for many years appears to be passing away. The deaths from respiratory tuberculosis last year numbered 21,930, or about half the average yearly number recorded during the last decade of the nineteenth century. New cases numbered 43,205, not many more than half the annual number just previous to the last war. In non-pulmonary tuberculosis there was a slight increase of notifications—from 12,661 to 12,810, with a fall, however, in the number of deaths. The increase is associated with the larger number of persons treated in residential institutions under county authorities. It is thought that the improved services in the counties may explain the increase. In Wales the death rate is also declining, but the decline lags behind the English figures.

"The Camp Follower of War"

Venereal disease, a problem of declining importance, comes forward again as "the camp follower of war." Increased sexual promiscuity due to the heightened nervous tension and excitement is a sufficient explanation. The shift of large numbers of people to areas hitherto sparsely populated may be associated with outbreaks of the disease in places unprovided with facilities for treatment. It will be necessary for county and county borough authorities in some areas to extend existing centres and in others to set up additional ones. It is suggested that the best way of meeting the difficulty would be to form mobile units, each consisting of a specialist in venereal diseases, a nurse, an orderly, and perhaps a clerk, with a motor vehicle containing equipment. Such a unit would take over the work of any existing centre which in the war emergency had been left without personnel if the gaps could not be filled from local reserves. It could also offer facilities for treatment in new places where outbreaks of venereal disease had occurred and the distance to the nearest centre was too great for those infected to attend it regularly.

Smooth Running

The Insurance Medical Service has reached the happy position of having nothing to report except continued efficiency. The number of complaints made by insured persons in respect of the treatment given by their practitioner is almost negligible. The cases investigated by medical service subcommittees last year numbered 141, but in only forty-one was any fine imposed upon the practitioner, and no practitioner was struck off the list. There were fifty-six other cases in which remuneration was withheld because proper medical records had not been kept or information furnished. When it is remembered that this is a service covering eighteen million people and employing seventeen thousand practitioners, and that the possibilities of misunderstanding inherent in the delicate relationship of doctor and patient—even when that relationship is not complicated by a doctor's bill—are constantly in the offing, the evidence of smooth working is truly remarkable. The regional medical staff of the Ministry dealt with 453,000 references, nearly all of them from approved societies, and nearly all for decision as to incapacity. The staff also paid just upon 12,000 visits to practitioners in connexion with their duty of administrative supervision of practitioners' prescribing, their certification of incapacity, and their keeping of records.

The report covers still other fields of public health. One of them concerns food control. Incidentally, a very large prevalence of avian tuberculosis has been found by inspectors in poultry markets. There is also recorded the discovery of a business (since closed down) in the Midlands in which dead one-day-old chicks or dead unhatched chicks were used as a filling paste for pies. There were seventy-two outbreaks

of Salmonella infection, with 230 cases and eight deaths. *S. aertrycke* was identified in thirty-seven of the outbreaks.

The story is also told of port sanitary work, which, like the British Navy, is a silent but ceaseless service. The work of guarding this country against the spread of epidemic disease requires "much toil and trouble on the part of medical officers of our national health organization, a wide experience of epidemiology, constant observation, the instinct of a detective for finding clues, and the patience of Job in conducting an investigation." During the year 1,068 vessels on which infectious disease was present or had occurred on voyage arrived at twenty-three ports in England and Wales. At these same ports over 10,000 rats were examined for indications of plague infection. Air ports are now added to the Ministry's responsibility.

Several interesting papers by members of the medical department of the Ministry are printed as appendices. The subjects include puerperal mastitis, an outbreak of toxic polyneuritis on a steamship, and an inquiry into hydatid disease in Wales. And there are enough tables to employ amateur statisticians for a winter of "black-out" evenings.

PREVENTION OF TUBERCULOSIS

The National Association for the Prevention of Tuberculosis held its annual conference in Belfast last summer, and the *Transactions* which have now been published are of interest and value to all who are concerned in any way with tuberculosis in the community. Among the subjects dealt with are: problems of organization and local administration of tuberculosis schemes, including arrangements for the induction of artificial pneumothorax and the after-care of patients so treated; tuberculosis in the adolescent; and architectural problems of tuberculosis institutions. Such a survey as these *Transactions* present is of much more immediate value than many textbooks on the treatment of tuberculosis, and certain suggestions put forward indicate some important issues. Thus it is urged that artificial pneumothorax involves the co-operation of a thoracic surgeon with a specialist physician equipped with full *x*-ray facilities. This procedure should be utilized in 50 per cent. of cases of open pulmonary tuberculosis, and hospital beds should be available for these patients. Large tuberculosis clinics should have central "filling stations" and a sufficiency of artificial pneumothorax apparatus, while after-care on sanatorium routine lines should follow in all cases. This operation should never be considered as a substitute for sanatorium treatment. It is pointed out that symptoms of tuberculosis in adolescents might be absent or slight, including a constant succession of colds, aphonia in young women, mental and physical lassitude, failure to increase weight with growth, erythema nodosum, amenorrhoea, and changes in disposition. Radiographic examination is essential, and the results may be very startling. The presence of tubercle bacilli in the sputum indicates that ulceration into a bronchus has already occurred and is therefore a late sign. The rising cost of building sanatoria is in some measure due to the unfortunate tendency to "go one better" than the last and does not necessarily make for greater efficiency of work and administration. The *Transactions* may be obtained from the offices of the National Association at Tavistock House North, Tavistock Square, London, W.C.1.

Cardiazol Shock.—This treatment was given to 207 schizophrenic patients, to twenty-four suffering from depression, and to fifteen cases of mania. Complete remission of the symptoms was obtained in all the patients in the last two categories as well as in a good proportion of the schizophrenic cases, notably in those whose mental disturbance was of recent date. Hahnemann tempers his praise of this treatment with the reservation that it needs to be supplemented by rational psychotherapy.—One Year's Clinical Experience of Psychoses treated with So-called Cardiazol Shock. V. Hahnemann.—*Ugeskr. Laeg.*, June 29, 1939, **101**, 771.

MEDICAL EDUCATION IN WAR TIME

EMERGENCY MEASURES

[FROM A SPECIAL CORRESPONDENT]

Anxious parents and others have been writing to the lay press about the disruption of medical education. The suggestion has even been made that the teaching of medical students is at a standstill. Upheaval there has certainly been, especially in the London area, with the considerable emptying of what have hitherto been known as the teaching hospitals and the transfer of their staffs to country hospitals in the sectors. But a position for which there was no precedent was met by the deans and other administrators with such resourcefulness that it now seems possible that the war, so far from having dealt a paralysing blow at medical education, may in fact establish it with an improved organization.

Medical education is being continued at not far short of normal levels. The students in some cases are suffering inconvenience due to dispersal, but it cannot be said that they are under educational disadvantage; indeed, in some respects they have opportunities which were denied to their predecessors. One of the several deans from whom was sought the information which follows, the Dean of the London Hospital Medical School, stated that the clinical material available to his students had been increased sixfold as a result of war conditions, without taking into account the number of chronic sick in public assistance institutions or the patients in mental and in fever hospitals. The number of teachers, he added, had also increased, with the result that the classes are smaller while the number of beds allocated to each student is larger. He acknowledged that his own hospital was in an exceptional position, as it was responsible not only for Sector I (Essex) but also for Sector II (North-East London and parts of Middlesex and Hertfordshire), with a considerable number of municipal and voluntary hospitals suitable for teaching purposes. This dean expressed the hope that the new arrangement which the war has precipitated would never be altogether abandoned. Another dean also referred to the value of the assistance now being rendered by people not normally on the staffs of hospitals and by staffs of hospitals not normally taking students. Admittedly there has been disarrangement of time-tables, a certain amount of what may be called geographical inconvenience, and a temporary contraction of facilities in some respects, but those may in the end prove to be small set-offs against a considerable educational gain.

London Medical Schools

The pre-clinical students of the London schools have been evacuated to other centres—Cambridge, Leeds, Bristol, Oxford, Glasgow, and the University of Wales, among others. The following brief statements of the position at the London schools relate only to clinical students.

St. Bartholomew's.—Clinical students are housed at thirteen institutions. The distribution in October was seventy-five at St. Bartholomew's itself, thirty-nine at five aid posts around the hospital, fifteen at the London Fever Hospital, four at St. Mark's, eleven at the Royal Chest, thirty at the Royal Northern, and 281 at seven other hospitals within the sector outside London. It has been possible to arrange for students at the outlying hospitals to go for instruction to the three centres: St. Bartholomew's, Friern (New Southgate), and Hill End (St. Albans). First-year students are stationed at Hill End, where a course of preliminary medical studies has been arranged, and dresserships and clerkships are taken there. At St. Bartholomew's itself the students in the intermediate years are taken in the special departments. At Friern the students in their final years receive tutorial instruction just before their examinations. Teaching in midwifery is spread out all over the sector; there are actually more midwifery cases than the college had in peace time. There are large

units at Luton, St. Albans, and Highgate, and it is still possible to use the City of London Maternity Hospital and the district. Clinical cases are coming in large numbers. At the moment of writing (mid-November) there are 700 occupied beds in the sector (civilian and military sick). Out-patient material is somewhat meagre. From 400 to 500 out-patients attend daily at St. Bartholomew's, and out-patient departments have been opened there for ear and throat cases, eye cases, gynaecology, orthopaedics, dermatology, and tuberculosis. Arrangements have been made with a fever hospital. There are psychiatric specialists at all the hospitals where teaching is done, and at Friern 2,000 mental patients are available. Pathology is centred at Hill End, but some clinical pathology is taught at other centres. The Dunn laboratories at Bart's are kept open.

Charing Cross.—The principal centres of instruction are Charing Cross itself, and Stanmore, Watford, and Ashridge, where students are accommodated in large groups; there are smaller groups of students at other sector hospitals. About 20 per cent. are at the hospital in London. Lectures are given according to definite programmes for each centre. In some cases there are three lectures a day in addition to clinical work. Previously all experience of practical midwifery was obtained at Charing Cross. "External" facilities have now been found, and it is possible to provide all the work in this subject required by regulations.

Guy's.—Clinical studies are being undertaken at Guy's and at the county hospitals at Farnborough and Pembury. The distribution of students among the hospitals varies each quarter. During the present period approximately one-third are at Guy's, a quarter at Farnborough, a quarter at Pembury, and the remainder are divided between Orpington War Hospital and Joyce Green, Dartford. The students at Guy's itself are chiefly seniors in the last six months of study and first three months students. Systematic lectures are given at Guy's and also at Farnborough. The facilities available for teaching obstetrics include classes, out-patients, and wards at Guys and obstetric wards at Farnborough and Pembury.

King's College Hospital.—Clinical studies are undertaken at six hospitals in the sector, students being distributed proportionately according to the number of beds in each. About 25 per cent. of the students remain at Denmark Hill. Lectures are given according to the requirements of the various examining boards. Municipal and county hospitals are also affording instruction. Midwifery cases are attended by students at four hospitals in the sector, including King's College Hospital itself.

The London.—One-fifth of the students remain at the London Hospital. The remainder are distributed more or less in proportion to the number of beds at the various hospitals scheduled to receive casualties in Sectors I and II. Students have not been allocated to hospitals remote from London, such as Bishop's Stortford, Hitchin, and Colchester, and about half the students are at hospitals easily accessible to the London by bus or tram. Nor have the students been allocated to hospitals where no facilities for medical education exist, except in the case of a few hospitals in peculiarly vulnerable areas, such as Albert Dock and Tilbury. A number of the students work in the morning at the hospital to which they are attached, and come to London for systematic teaching in the afternoon. Systematic teaching is also in progress at King George Hospital (Ilford) and Southend General Hospital. At the London there is teaching in the out-patient departments in the morning, demonstrations in pathology at noon, clinical demonstrations in medicine, surgery, or obstetrics in the afternoon, and later still routine lectures. Clinical teaching in obstetrics is in progress at six hospitals and on the London Hospital district. Pathology is taught at four centres, but after Christmas the teaching in this subject will be centralized at the London. Every student is to spend one month at a mental hospital and one month at a fever hospital, an opportunity which has never occurred before.

Middlesex.—Clinical studies are undertaken at Middlesex and at nine other hospitals in the sector. The clinical students number 211, about fory of whom remain at Middlesex; five other hospitals have about twenty-five students each, and four others have about eleven each. Clinical lectures are arranged by the authorities at each hospital in the sector, according to facilities available. For other lectures certain centres have been selected, and students attend the nearest. Students attend for instruction in obstetrics first at Middlesex and later at St. Mary Abbots or Willesden Maternity.

Royal Free.—There are 151 students taking clinical studies at the Royal Free (of whom 37 are taking the finals in November or January), 44 at Three Counties Hospital, Arlesey, and a small number at St. Albans. A full time-table of lectures, etc., has been arranged at the Royal Free and at Arlesey, so far as possible in accordance with pre-war arrangements for clinical students. Students attend rounds at two L.C.C. hospitals. Lectures, demonstrations, and tutorials in obstetrics are arranged at the Royal Free, and students attend a maternity clinic and are on the Royal Free district for practical midwifery. Facilities are available for small numbers of students at three or four other places.

St. George's.—Clinical studies are being undertaken at the central hospital, where one-third of the students still remain, and at seven other hospitals, principally at West Middlesex County Hospital, Isleworth, and at Staines and Slough. Special acknowledgment is made of the assistance of the West Middlesex Hospital, which provides excellent material, and the members of its staff are most helpful in teaching. Facilities equal to the normal requirements for the teaching of obstetrics are available at one of the hospitals in the sector.

St. Mary's.—Of the 230 clinical students roughly half are at the four London hospitals in the sector. There are about four students for each hundred beds. The sector comprises a large number of county council hospitals. There has been no difficulty in arranging for teaching in obstetrics, which is available at several of the sector hospitals. A pathological course began at St. Mary's early in December. Arrangements have been made whereby students will be moved from place to place in rotation in accordance with the courses they require. Valuable assistance has been afforded by the staff of the British Postgraduate School and by some of the members of St. Thomas's staff at Park Prewett. In addition members of the staff of the London and Middlesex County Councils have helped in every way possible. Certain clinical teachers of St. Mary's are stationed at each hospital, and courses of instruction are given. There are regular lectures at each centre. The students are said to be thoroughly content with the teaching and clinical material at the various institutions, and on the whole it is the general verdict that while something has been lost in these novel war arrangements more has been gained, notably closer contact between patient and student and between student and teacher.

St. Thomas's.—At present the main clinical studies are being carried on actually at St. Thomas's and at Kingston County Hospital; there are 120 clinical students working at St. Thomas's, and roughly 24 students at four hospitals in the sector are carrying through a period of three months' study which will be credited to them in the examination schedules. Lectures are given both at Kingston (elementary clinical work) and at St. Thomas's, much in line with the systematic and clinical lectures of peace time. Kingston is providing facilities for clinical students beginning their studies, and instruction is given there by members of St. Thomas's staff and the staff of the hospital. Obstetrics teaching is being carried on with the co-operation of three hospitals, two of them L.C.C.

University College Hospital.—The medical school is using a considerable number of hospitals in the sector, for which purpose the sector has been divided into four groups. One group comprises University College Hospital itself, with five others, voluntary and municipal, in London, which are taking students. A second group of four hospitals works around Leavesden Mental Hospital as a centre. A third combines the Hampstead General Hospital, the North Western Fever Hospital, and New End Hospital, for general medicine and surgery and special departments, and, at New End, a little midwifery. The fourth group is centred at Edgware and includes three large hospitals. At U.C.H. there are 200 beds

for casualties and 110 for civilian sick, with a considerable number of lying-in beds. Two-thirds of the midwifery is being done there. While the school is not turning students away, it is very near what would be considered full numbers. For the first month or so of the war students were distributed where it was thought they would be wanted for casualties, but during October the school arranged for every student to be doing the work he should be doing according to the educational programme. Some things cannot be done owing to shortage of patients and shifting of pathological facilities, but students are getting the education they ought normally to receive, and assistance is being rendered by people not ordinarily on the staffs of hospitals and by staffs of hospitals not ordinarily taking students. Lectures are being given at University College Hospital and at Leavesden and Hemel Hempstead.

Westminster.—Clinical studies are being undertaken at Westminster (89 students), St. Mary Abbots (6), Fulham (10), and St. Stephens (L.C.C.) (4). All the students are in London. A full programme of lectures is given at Westminster Hospital and facilities for teaching obstetrics are provided as in normal times.

Provincial Medical Schools

At the provincial schools there has been less disturbance than in London. At Birmingham clinical students are all allotted to the various units of the United Hospital. As the practical clinical work is on a smaller scale than in peace time rather more lectures and demonstrations are being given. Facilities for teaching in obstetrics are reduced but still sufficient. There is no reason why the time at which each student may appear for his successive examinations should be delayed by the rearrangements which have been made, and the school has every hope that the training will be as efficient as in peace time.

At Bristol clinical teaching is being carried on in the same hospitals as in peace time, and lectures are given exactly as under normal conditions. At Cambridge for their clinical work students go to London and provincial hospitals. At Newcastle clinical studies are taking place normally in four hospitals, mainly in the Royal Victoria Infirmary. Although the out-patient department was closed at the outbreak of the war, it was reopened within a fortnight. The necessary lectures are being given, with some readjustment of time-tables. At Leeds clinical studies are being undertaken at the usual hospitals, among which the students are distributed as in peace time. At Liverpool and Manchester teaching follows normal lines. At Oxford fifty students began clinical work in October and a certain number of more senior students have returned to Oxford from elsewhere. Lectures are being given as arranged by the committee for clinical teaching and approved by the Board of the Faculty. At Sheffield the usual programme is being followed. At the Welsh National School of Medicine work is continuing so far as possible under normal conditions. Certain of the beds at all the hospitals at Cardiff have been evacuated, but clinical teaching is being given at the main teaching hospitals—namely, Cardiff Royal Infirmary and two corporation hospitals.

Many of the provincial schools are acting as hosts to London pre-clinical and first-year medical students. Bristol has received pre-clinical students from the Middlesex. Cambridge has given facilities to the London and St. Bartholomew's students for pre-clinical work. At Leeds twenty-six students from King's College, London, have been admitted to the first-year medical course. Charing Cross pre-clinical students are also being taught at Leeds and at Glasgow. Manchester has over one hundred students from St. Mary's Hospital, London, for pre-clinical study in anatomy and physiology. Oxford has St. Thomas's pre-clinical students. At Sheffield thirty-five women students from University College, London, are taking anatomy, physiology, and pharmacology. At Cardiff a number of students from University College Hospital Medical School have been received for their first clinical year. Birmingham also, though an evacuation area, has received students from other schools.

Reports of Societies

CHEMOTHERAPY IN MOUTH INFECTIONS

At a meeting of the Section of Odontology of the Royal Society of Medicine on November 27, Mr. S. F. St. J. Steadman presiding, Professor A. FLEMING gave a paper on antiseptics and chemotherapy.

Professor Fleming first reminded his audience that there were natural anti-bacterial substances in the mouth, and that when chemical antiseptics were used the action of these on the natural antiseptics should be appreciated. There was a powerful anti-bacterial substance in the saliva, and in the mouth as elsewhere there were phagocytic cells which played a large part in resisting infection. Turning to the sulphonamides, he said the first thing to remember about them was that they were specific in their action; they would act on some organisms but not on others. They had little or no action when bacteria, even the most sensitive, were in large numbers. A third point was that peptone, as well as large numbers of bacteria, inhibited the action of sulphonamide. Finally, the chief action of these drugs was bacteriostatic, and it was the natural defence mechanism of the body which completed the destruction. The action would therefore be most dramatic when the infection was by a very sensitive organism such as the haemolytic streptococcus, and where there was no marked localization of the infection. If there was a localized infection, more especially an abscess, such dramatic effect need not be expected. In these cases the numbers of bacteria were likely to be large, and in the abscess tryptic ferments would be liberated from degenerated leucocytes with the consequent production of peptone.

There was one aspect of this drug therapy which might be important in war time. Surgeons were afraid formerly to excise wounds that were infected with the haemolytic streptococcus because of the danger of opening fresh tissues which the streptococcus would invade, thus giving rise to septicaemia. But sulphonamide could be administered to the patient so as to obtain a good concentration in his blood, and the surgeon could get rid of the sloughs, excising the wound without any danger of spread. As the body had to complete the destruction of the infected bacteria, it was clear that better results would be obtained when the natural defences were as efficient as possible. It was important, therefore, to use all possible means of raising the immunity. Several methods of doing this were available. It might be done passively by the administration of serum, or actively by vaccines. So far as odontological practice was concerned there were not many serums with any real bactericidal action on the microbes of the mouth, but an autogenous vaccine could be made with the greatest ease, and it should be possible to immunize the patient to a point at which the drug might be expected to have a much better effect than if used alone.

Dr. E. W. FISH said that one serious problem in dental practice was the danger of giving a bacteriaemia to a child who might have some incipient trouble leading on to endocarditis. It was not always convenient to carry out cauterizing of gum margins in a child before taking out a tooth. Unfortunately it appeared that certain organisms were not at all susceptible to the action of sulphonamide drugs, and he wondered whether Professor Fleming could indicate the organisms commonly found in the mouth which were susceptible and those which were not.

Mr. JOHN BUNYAN said that a healthy, perfectly formed mouth was one of the cleanest parts of the body, but unfortunately a healthy mouth was rarely encountered. It was commonly abused by unsuitable food, tobacco smoke, alcohol, the use of a hard brush, and patent antiseptics. The question of local antiseptics was an extremely important one to the dental surgeon, and one that had not been much investigated. He himself had tried all the antiseptics offered for use in the mouth, and had found hypochlorites most useful for what they were required to do—namely, to clean out the albuminous masses, dead bacteria, and the food debris. To use vaccines was to deal with the problem at the wrong end.

MR. B. W. FICKLING said that at the Royal Dental Hospital there had been some investigation of the mode of action of these drugs, and many of the investigators considered that the concentration of the drug at the site of infection was important. Some work had been done on the concentration of M & B 693 (sulphapyridine) in the saliva, and it was found that whereas this drug was present in the mouth in all the cases it was only present in about one-third to one-fourth of the concentration in the blood. With regard to the use of these drugs in incipient submaxillary abscesses, he had analysed sixteen cases which had been admitted to the Royal Dental Hospital for this condition. Of this number twelve required incision no matter whether they had had sulphapyridine or sulphanilamide or had not, and only two cases could be called successes in the sense that when incision failed to cure the sulphonamide drug proved effective.

Professor FLEMING, in reply to Dr. Fish's question concerning the possibility of bacteriaemia after extraction, said that so far as his limited knowledge of the conditions in the mouth went the question of the sensitiveness of mouth microbes to these drugs had not been worked out. If the organisms were sensitive he had not the slightest doubt that bacteriaemia could be prevented. A question had been raised about the strength of the drug in the saliva. It was in the infected tissues, not in the saliva, that one wanted to kill organisms. Doubtless in the infected tissue outside a pocket one would get the drug in much the same concentration as in the blood, but it might be much weaker in the saliva and yet act perfectly well as regards the infection.

Chemotherapy in Gingivitis and Pyorrhoea

DR. A. J. COKKINIS, in a short communication, described some work which he had superintended in a small chemotherapy clinic at St. Mary's. The object was to discover the value of chemotherapy in *S. viridans* infections, especially pyorrhoea. Cultures were taken from the patients' gums at various stages of pyorrhoea and gingivitis, and *S. viridans* was discovered in practically every case, sometimes in pure culture, very often mixed with non-pathogenic organisms, and in quite an appreciable proportion of cases mixed with *S. haemolyticus*. Over seventy cases had been treated with sulphonamide compounds—namely, sulphanilamide, sulphapyridine, and uleron. The last-named proved much less effective than the others. There was little difference between the first two, provided the sulphanilamide was given in rather larger doses. The majority of the patients showed some clinical response to treatment, however advanced their pyorrhoea. He was convinced that the obvious manifestations of acute gingivitis, whether localized or diffuse, could be made to clear up completely in about a week by oral administration of sulphanilamide or sulphapyridine, 3 to 4 grammes daily. The fetor and the morning stain on the teeth and lips completely disappeared. The oedematous interdental papillae shrank and the large lymph glands which had been observed in some of the cases subsided. This result could be produced by sulphonamide therapy without any adjuvant measures at all. But it was quite certain that one course of chemotherapy did not suffice to cure gingivitis, the condition relapsing a week or so afterwards. By giving further courses, however, and particularly by increasing the immunity response by preliminary and accompanying vaccine therapy, the infection could be indefinitely delayed for six months or more. In cases with a deeper infection, with pus pockets, apical abscesses, and loosening of the teeth, chemotherapy and immunotherapy could only play a secondary part, if any at all. There were evidences of anti-bacterial activity, however, even in these cases, the pain of a pulp infection being relieved or a pus pocket cleared up. But this was temporary, and cure could only be obtained through the odontological surgeon. An incidental benefit was the prevention and treatment of the septicaemia occasionally produced by the bacterial shower liberated into the blood stream after the extraction of several septic teeth. He had seen cases in which this septicaemia had cleared up quickly under sulphonamide compounds, and it was probable that vaccines and a short course of sulphonamide therapy would largely abolish these unpleasant complications of dental surgery.

Local News

IRELAND

Tuberculosis in Belfast

The report for 1938 of the chief tuberculosis officer for the county borough of Belfast states that 2,200 persons, notified as suffering from signs of tuberculosis in various forms, were examined during the year. Of these 36 per cent. were found to be tuberculous, and a further 7 per cent. suspect. The total number of patients who received treatment or who passed under observation was 7,842. It was found that 47 per cent. of new tuberculous patients examined had a definite opportunity of infection through contact with other tuberculous patients among their own family connexions. The report stresses the importance in avoiding infection of scrupulous care, not only in the disposal of sputum, but in the cleansing of the hands and of table utensils. It is suggested that every patient and attendant should have a separate set of table utensils for his own use. The application of P.P.D. (purified protein derivative) tests proved to be especially valuable in children. A positive reaction may provide early diagnosis; repeated tests at periodical intervals may furnish helpful guidance concerning the progress or regression of the disease. On the other hand, a negative reaction, especially in the higher dilutions of P.P.D., prevents sufferers from bronchitis or wasting being wrongly labelled as tuberculous. Application of the test to children of pre-school age may aid in the discovery of a hitherto unsuspected case of tuberculosis in the household.

Medical Research Council of Ireland

The Medical Research Council of Ireland has made the following awards: Dr. W. R. F. Collis and Dr. Oliver FitzGerald, each a grant-in-aid for special apparatus; Dr. Martin G. A. Little, part-time grant for one year from January 1, 1940, for an investigation of the nervous control of the digestive glands, the work to be carried out in the department of physiology, University College, Galway, under the direction of Professor J. F. Donegan; Dr. D. P. Murnaghan, grant-in-aid towards the expenses of his research training in the department of embryology, Carnegie Institution of Washington, Baltimore, U.S.A., under the direction of Dr. George Streeter. Whole-time grants have been renewed for further periods as follows: Mr. Patrick Boyle, one year; Dr. T. G. Brady, one year; Dr. P. J. Holland Clarke, six months; Mr. R. P. Cooke, one year; and Dr. Cecil Mushatt, five months. Part-time grants renewed are: Dr. Oliver FitzGerald, one year, and Dr. D. K. O'Donovan, one year. The grant-in-aid awarded to each of the following has been renewed: Dr. E. S. Duthie, six months; Dr. Ninian Falkiner, one year; Professors W. R. Fearon and R. W. Ditchburn, six months; Dr. Gerald FitzGerald, one year; Professor J. B. Gatenby and Miss O. E. Aykroyd, one year; and Dr. David Mitchell, one year.

SCOTLAND

Scottish Mental Pathology

The annual report for 1938 of the Scottish Mental Hospitals' Pathological Scheme gives a short summary of the work of Dr. Campbell, the pathologist, in collaboration with his predecessor, Professor Biggart, on the nature and incidence of the polio-encephalitis first described by Wernicke. The opinion is put forward that this disease is not necessarily restricted to cases of alcoholic excess, but may occur in a wide variety of conditions of bodily privation or exhaustion. A lack of vitamin B_1, whether or not associated with an infective focus,

is regarded as a potent factor in its causation. The report points out the importance of this research with a view to the diagnosis and treatment of the many obscure, obviously organic cases of mental and cerebral deterioration, with no evidence of arteriopathic degeneration sufficient to account for the symptoms, which are received every year in mental hospitals. Among other researches mentioned are an investigation of the influence of the thyroid on the temperature disturbances produced by experimental lesions in the hypothalamus, an experimental study of the quantitative variation of the cerebral capillary bed under different conditions, and an investigation into the reactions of the cerebral vessels in normal and hypertensive animals. Routine work comprised 252 histological examinations, including examination of 221 brains.

Edinburgh V.D. Scheme

The annual report for 1938 of the City and Royal Burgh of Edinburgh Venereal Diseases Scheme describes the year under review as a period of transition from older and less efficient to recent improved methods of treatment. The adoption of the new chemotherapy for gonorrhoea produced a marked drop in the number of out-patient attendances, with the substitution of one interview with a medical officer every day for thrice daily irrigations. Sulphapyridine (M & B 693) is now given as the routine treatment of gonorrhoea in all its manifestations, including vulvo-vaginitis in young girls and ophthalmia neonatorum. The proportion of successful cases is estimated at approximately 90 per cent. The only disadvantage of the new form of treatment is that the symptoms subside so rapidly that patients too often fail to continue attendance for the prescribed period. With regard to syphilis the report states that increasing use is being made of the pentavalent arsenical compounds, acetylarsan and tryparsamide. The total number of cases during the year shows a slight increase. Routine Wassermann testing is advocated, a procedure which in Denmark has resulted in a striking decrease in the death rate from congenital syphilis. In follow-up work some difficulty is experienced regarding "problem girls," those who have had not only one but two or three illegitimate children. These girls readily become infected with venereal disease and are a source of danger to themselves and society. Although sterilization would prevent the production of children by irresponsible parents, it would only lead to further promiscuity and increased chances of the spread of disease. The provision of a suitable home or institution for this type of girl would contribute to the solution of the problem.

Correspondence

Cancer of the Lung

SIR,—In a letter in the *Journal* of April 2, 1938 (p. 755), I drew attention to the presence of some form of silica and iron in certain dusts that were under suspicion as causing cancer of the lung.

It was stated therein that experiments with mice were being conducted to study the effects of iron and silica dusts separately. These experiments, although not all completed, have reached a stage at which it is already established that exposure six times a day on five days of each week for one year to dust clouds consisting either of precipitated silica (SiO_2) or of iron oxide (Fe_2O_3) increases the incidence of primary lung tumours in mice, compared with that for control mice from the same stock and not specially dusted. About sixty mice lived to ages greater than ten months, and of these only 6 per cent. of the controls exhibited primary lung tumours compared with 20 per cent. of the sixty mice dusted with silica; this silica experiment is completed. The silica produced fibrotic nodules in the lymph nodes, but there was less indication of fibrosis in the lung tissue, much of the silica being removed by way of the trachea and by the lymph channels. With the iron oxide dust, although the experiment is not completed, the incidence of lung tumours is already sufficient to give over 20 per cent. for the total dusted mice living ten months or longer; all the mice are not dead yet. Thus the iron oxide seems more potent than the silica, but such fine conclusions may not be drawn, since the lungs seem to contain more iron oxide than silica.

In any case the increases due to silica and to iron oxide seem together sufficient to explain the 45 per cent. incidence of lung tumours obtained in mice exposed to road dust from which the tar had been extracted by benzene (*Brit. J. exp. Path.*, 1937, **18**, 215). The highest incidence (74 per cent.) occurred in the mice exposed to road dust containing tar (*Brit. J. exp. Path.*, 1934, **15**, 287; ibid., 1939, **20**, 122), and it might be considered that 74 minus 45 per cent.—that is, 29 per cent.—were due to the tar and the remainder of the excess of the 45 per cent. over the normal incidence might be regarded as being due to such inorganic constituents of the dust as silica and iron oxide. Since these constituents are also in the general atmospheric dust, it is not unreasonable to hold that some of the tumours present in control mice are due to similar causes. There is evidence that iron and silica may cause cancer of the lung in man (Dreyfus, T. R., *Z. klin. Med.*, 1936, **130**, 256; Kennaway, N. M., and Kennaway, E. L., *J. Hyg.*, Camb., 1936, **36**, 236; Turner, H. M., and Grace, H. G., ibid., 1938, **38**, 90).

It has been suggested by several observers that cancer may originate in cells suffering from anoxia. To test this in the lung an experiment has been conducted for nearly three years with mice bred and living almost continuously under low oxygen pressure (13 to 15 per cent.—mostly 13—of one atmosphere) in a chamber. Thirty-two of such mice older than ten months have died, and of these over 30 per cent. have exhibited primary lung tumours. They have not been specially dusted, but have been exposed to some dust from soda-lime (used to absorb carbon dioxide and moisture), and also to dust from the sawdust bedding and from the mixed grain-and-bread diet. Fifty-three controls which had been shut up in a similar chamber with soda-lime, etc., but with normal oxygen pressure—namely, 20.9 of an atmosphere—show an incidence of 15 per cent. for primary lung tumours, so that the anoxia appears to double the incidence. Primary lung tumours often seem to originate in a portion of collapsed or thickened lung, and presumably the centre of such an area might suffer from some degree of oxygen want, which might be one of the factors in tumour formation. The experiment is being continued, and full details of the above result will be published elsewhere.

To date 363 control mice have given 12 per cent. incidence of primary lung tumours; on the other hand, 542 similar mice exposed to various dusts under suspicion as causes of lung cancer in man have given 36 per cent. incidence.—I am, etc.,

London, N.W.3, Nov. 29. J. ARGYLL CAMPBELL.

The Intervertebral Disk

SIR,—Having recently spent ten months at the Mayo Clinic, and having been deeply impressed with the work there on protruded intervertebral disks, I was particularly interested to read Mr. Pappworth's article on the subject in your issue of November 25 (p. 1038). He raises, however, several points which seem to me to be controversial and worthy of discussion.

His use of the phrase "a critical review" as a subtitle seems hardly justified, for six of the seven articles which he uses as the basis for his arguments are from the same clinic, and, as he himself admits, they are concerned with the same series of cases. True enough, he includes one article from the Mayo Clinic, but refers to it only once apart from direct quotation. His main argument seems based upon the fact that he has discovered several statistical discrepancies in the six papers of the Boston group, and it should be made clear that there is no similar quarrel with Camp and Love's paper. Nor does it seem reasonable to maintain that minor inaccuracies (which might be due to a change in the opinion of the workers) invalidate the claim that prolapsed intervertebral

disk is a clinical and pathological entity. It is fortunate that Dr. Love himself (*Proc. roy. Soc. Med.*, 1939, **32**, 1697) has recently restated with the utmost fairness the views generally accepted in America. This article itself is a complete answer to Mr. Pappworth, and should do much to advance knowledge on this side of the Atlantic. It is only necessary to emphasize several minor points.

It is by no means true to say that the appearance of the prolapsed disk after injection of lipiodol is "not clear." The smoothly rounded defect of an extradural type opposite an intervertebral space on the antero-lateral aspect of the cord is very characteristic, but it must be realized that if this defect is a small one it may be overlooked if the patient is not examined on a tilting table, when the actual flow of the oil can be observed. This point has been mentioned by Dr. Campbell Golding, and is one which may explain some of the failures of English radiologists to demonstrate the lesion.

Dr. Love explains that his cases at the Mayo Clinic are referred to him by the orthopaedic surgeons, but that the operation itself is a neurosurgical procedure. Mr. Pappworth views it from the orthopaedic angle, and asks if laminectomy is the only treatment. It should be clearly realized that the aim of operation is not to perform a laminectomy but to remove the prolapsed disk; that the orthopaedic approach is only a stage in the treatment. It is not too much to say that much of the odium which has been heaped on the operation in America itself is due to the efforts of orthopaedic surgeons, who have been content with simple decompression by a laminectomy without removing the disk, and who have been disappointed with the end-results. Indeed, I believe that in several cases the disk has been removed through the interval between adjacent laminae without touching the lamina at all.

To argue that a lesion which can so project into the spinal canal as to reduce its calibre by at least one-half and yet cause no compression of the cord or nerve roots is to me flying in the face of all commonly accepted principles. We have no great difficulty in visualizing that a subdural haematoma can compress the brain, and I cannot see that it is logical to imagine that the spinal canal, which is equally a closed space, will behave differently. And certainly to anyone who has seen the defects in the lipiodol column either under the screen or on the radiograph there can be no question that there is an encroachment of some sort upon the canal.

I therefore conclude that Mr. Pappworth has failed to make good his claims, and that, to quote Dr. Love, "intraspinal protrusion of the intervertebral disks is a pathological entity. . . . It has a fairly definite symptom complex . . . laminectomy with removal of the protruded intervertebral disk should be performed . . . the results in 300 cases justify the method."—I am, etc.,

Leicester, Nov. 27. E. PETER ALLEN.

SIR,—In an article in your issue of November 25 (p. 1038) a contributor discusses retropulsion of the nucleus pulposus. The paper appears to be based entirely upon the meaning which Mr. Sidney Pappworth reads into the well-known work of Mixter and Barr. I find myself at variance with almost every statement made in this piece of armchair criticism, but had perhaps better confine myself to dealing with the three questions which Mr. Pappworth raised and answered.

1. Can retropulsion of the nucleus pulposus cause symptoms? If by this term Mr. Pappworth means the small and often multiple lesions found by Andrae in post-mortem specimens the answer is, almost certainly, No. It is a rupture of an intervertebral disk which causes neurological disturbance—a much larger lesion than that described by Andrae. The latter has probably no clinical significance in the present connexion. Mr. Pappworth does not apparently understand the pathology of the symptom-producing lesion.

2. Is laminectomy the only treatment? If symptoms are severe and persistent and a ruptured intervertebral disk has been demonstrated its excision is the only treatment. If Mr. Pappworth had seen one of these large fibrocartilaginous masses removed at operation I think he would realize the futility of waiting until it was "absorbed or cicatrized." As an orthopaedic surgeon he had better consider waiting until a torn medial meniscus in the knee-joint has been absorbed or cicatrized.

3. Are the results of laminectomy such as to justify operation? One has only to study the figures of Mixter and Love to feel satisfied that the results more than justify laminectomy; they indeed indicate it. Anyone who has seen a patient entirely incapacitated over a period of many months immediately relieved of symptoms by the operation will realize the value of this new method of treatment in suitable cases.

In speaking of the diagnosis of disk lesions Mr. Pappworth remarks that "the true appearance of a disk lesion is not too clear." This is a surprising statement, as the radiological features have been clearly set out since Mixter's earlier papers and have also been described in detail by his radiological colleagues. I find myself in agreement with two of Mr. Pappworth's statements: the first, that there should be a close season for the writing of articles; the second, that he is fortunate in having had enough leisure to examine the claims for a new procedure before operating, for I am certain that an operation carried out without a proper understanding of the lesion it is designed to treat can lead only to the disappointment of patient and surgeon. In this particular case it will also tend to obscure the value of Mixter's excellent work.—I am, etc.,

London, W.1, Dec. 1. J. E. A. O'CONNELL.

Treatment of War Wounds

SIR,—Dr. Bhatia (November 25, p. 1062) raises the issue between plain gauze and vaseline gauze. I think everyone has experienced the disadvantage of the use of gauze with its wide mesh which can easily be penetrated by granulations. As a result the deepest strands of gauze are often built into the granulation tissue and can only be torn out by force with pain and haemorrhage. This happens to a considerable degree in spite of thorough impregnation with vaseline. To avoid this undesirable event I have for years laid on the deep surface of the saucerized wound a layer of ordinary thin linen bandage, about fifty threads to the inch. Until recently this, too, was impregnated with vaseline; now it is plain. Two or three six-inch lengths of four-inch or six-inch bandage will generally cover a moderate-sized wound. Each slightly overlaps the next. As the gauze packing is subsequently pushed gently into the wound it carries this thin linen "tablecloth" in front of it. The mesh is too fine for penetration by granulation tissue but offers no resistance to soakage. Weeks later it peels off the granulations far more easily than gauze, with little or no discomfort and much less bleeding.—I am, etc.,

Headington, Oxford, Nov. 28. G. R. GIRDLESTONE.

Treatment of Wounds by Closed Method

SIR,—The remarkable results obtained by Dr. Trueta by the closed-plaster method of treating excised bomb wounds are arresting to those who gave thought to wound treatment in the last war.

It was obvious that the minds of many present at Dr. Trueta's lecture at the Royal Society of Medicine were groping for a satisfactory explanation of this revolutionary method. Much light is thrown on the application of the closed principle in an article in the *Australian and New Zealand Journal of Surgery* of July, 1939 (p. 72), by Fay Maclure, on mechanical principles in the causation and treatment of disease, under the heading of "Limiting and Enveloping Membranes." He writes:

"Life is dependent on tension. . . . There must of necessity be a restraining or limiting layer of membrane. When the integrity of the enveloping membrane is destroyed, as, for example, in herniation of muscle through torn fascia, the mechanics of the contents is completely disordered. One of its principal effects is on the circulation. . . . The rebound mechanism whereby the energy of arterial pressure is transformed into an accessory pump, maintaining the flow of lymph and venous fluid, is dependent on a resistant layer. When that membrane disappears the area of loss becomes an area of failing circulation, and stagnation and oedema ensue. To restore the circulation in the affected part it is necessary

to reconstitute the limiting membrane or to replace it with an efficient substitute. . . . Pressure therefore becomes an essential in the treatment of all unhealed areas."

Excision of damaged tissue cuts out the dead and presents a living front line to the attacking organism. Pressure on the front line keeps it living and active and enables circulation to play its part in the contest. The lines of communication are then unimpeded.

It would appear that Dr. Trueta and Fay Maclure have established a further principle of healing which if practised will confer untold benefits on injured man.—I am, etc.,

London, W.1, Nov. 29. E. T. C. MILLIGAN.

Treatment of Gas Gangrene

SIR,—I shall be grateful if you will give me space to correct an impression that Professor Girdlestone (*Journal*, December 2, p. 1110) has gathered from my letter (November 25, p. 1058). It would ill become one who went from Liverpool to France in 1914 to "gird" at the Thomas bed splint, an invention which has done so much to alleviate human suffering. Indeed, I well remember the acute disappointment I experienced when, with numerous cases of fractures waiting for them, a large consignment of Thomas splints by some dreadful mistake turned out to be in children's sizes.

I quite agree with Professor Girdlestone that correct application is essential, and we were specially favoured at Royaumont, for with characteristic generosity my kind friend Sir Robert Jones sent out to us his most highly trained sister, who stayed for a month and gave many demonstrations on his methods. May I now too, even after this lapse of time, acknowledge with gratitude the value of the articles on fractures under war conditions by Sir Robert Jones which appeared in your *Journal* in 1916. They were read and reread until the pages were ragged!

If I appeared to be unduly severe on the plaster-of-Paris method, I think it must be stressed that the interval which is likely to elapse between the infliction of the wound and the complete operative treatment is of vital importance if there is a likelihood of the development of gas gangrene. This was shown in the tabulated list of cases of gas gangrene I recorded after the battle of the Somme, where the interval extended into days, not hours. In such cases even a tight bandage can be disastrous, and I have seen a gangrenous hand encased in a skin-tight bandage—a bandage which under ordinary conditions would receive special commendation at a V.A.D. inspection. I wonder if it would be out of place here to urge upon first-aid lecturers to teach the practical method of application of the Thomas splint, even in the first course of lectures.—I am, etc.,

Killagorden, Cornwall, Dec. 4. FRANCES IVENS-KNOWLES.

Psychological Casualties in War

SIR,—Although it is not quite clear whether he is referring to civilian or military life, Dr. R. D. Gillespie's letter in the *Journal* of December 2 (p. 1110) suggests that "wide advertising of the supposed inevitability" of war-time increase in psychological disorders "does more harm than good." While this may be true in relation to the general public, it can at least do no harm for doctors to recall some historical facts about these disorders as they occurred in soldiers during and after the last war. Excluding psychoses, pensions for psychological disorders were awarded to more than 100,000 men. The cost of these pensions, according to an estimate made by the late Sir John Collie of the Ministry of Pensions staff, must have been approximately ten million pounds per annum in the years immediately after the war, and amounts to over four million pounds this year. If, as seems possible in this war, civilians may be submitted to the stresses which precipitated in soldiers a group of psychological disorders of this size, these facts cannot be entirely without bearing on the potential incidence of such disorders in our war-time civilian population.

Dr. T. A. Ross's current plea for observation of recruits during early training (December 2, p. 1110) repeats the similar strongly worded plea made by Sir William Osler over twenty years ago. At that time findings of the later War Office Committee on Shell-shock (1922) were to some extent anticipated by Dr. T. W. Salmon, an outstanding American psychiatrist, who was sent to England from that country through the co-operation of the Rockefeller Foundation to study the problem of psychological disorders in the British Army. His report mildly indicated the difficulties which had arisen over what was then a novel problem. Speaking of the British Army experience, he pointed out that it "carries important lessons; more important than all others is the result of careless recruiting." "The importance of providing, in advance of their urgent need, adequate facilities for the treatment and management of nervous and mental disorders can hardly be overstated."

The problem of psychological disorders is no longer novel, and this time there can be little excuse if we fail to make an attempt to deal with it.—I am, etc.,

London, W.1, Dec. 4. A. T. M. WILSON.

SIR,—In your issue of November 4 Wing Commander R. D. Gillespie stated that he had never heard of any data which purported to show a rise in psychoneurotic illness during the war of 1914–18. If, as I suppose, he was referring to civilian sickness, it should be pointed out that there are no unassailable figures for the incidence of civilian psychoneuroses, either during or after the war. His statement that the incidence remains unaltered is not capable of either proof or refutation. It is not a fact but a belief.

In his latest letter (December 2) the belief has apparently widened in scope; for now he claims that mental illness *in general* was probably less during the last war than in peace time. There is some evidence to suggest that this may be true of certifiable mental illness. It is certainly not proven in the case of civilian psychoneuroses, and the belief is supported by no better evidence if it is extended to cover psychoneuroses in the Services. The true incidence of psychoneurotic illness in the Services in peace time is unknown. In the Army health reports it is obscured by the classing of such cases under such headings as "D.A.H.," "Disease of the Nervous System," "Disease of the Digestive System." Similarly, the incidence in the last war is unknown. Many such cases were treated at aid posts and casualty clearing stations and returned to duty without appearing in the official statistics. Some were diagnosed as malingerers and others shot by order of courts martial. Many more severe cases were misdiagnosed—for example, as "V.D.H."—or were left undiagnosed and labelled according to some presenting physical symptom.

The only statistics of any value are not of incidence but of more or less long-term disability. It is an incontrovertible fact that 103,257 pensions were given for psychoneurotic disability after the last war, and that well over a quarter were still being paid last year. In other words, one man out of every thirty on the day-to-day "strength" in the last war was considered sufficiently incapacitated by psychoneurosis to be given a pension, and one man out of every 103 on the day-to-day "strength" was considered sufficiently incapacitated *twenty years after the war* to merit continuance of that pension. These appallingly high figures are those of severe incapacity only. The figures of actual incidence must be much higher. Whether this war-time incidence is higher or lower than that in peace time is anybody's guess; but if Wing Commander Gillespie's guess is right it shows not that more facilities for treatment are unnecessary in war time but that our peace-time facilities are seriously inadequate. He is concerned lest the provision of treatment should breed psychoneuroses. Many of his colleagues are concerned about a much more real danger—namely, that such a cavalier attitude towards the problem of psychoneuroses may lead, as it did in the last war, to widespread personal distress and military inefficiency, with a bill of ten million pounds per annum for psychoneurotic pensions to follow. Dr. T. A. Ross's letters, and other evidence, suggest that our concern is justified.

The War Office committee of 1922 made recommendations to avoid the difficulty, which Dr. Ross mentions, of diagnosing potential psychoneurotics at a single short interview. It recommended that depot medical officers should be skilled

in the diagnosis of such personalities, and that the depot non-commissioned officers should be instructed in the behaviour characteristics for which they should refer recruits to the medical officer. In this way such recruits could be gradually eliminated during the period at the depot. The experience of the American Expeditionary Force teaches the same lesson. The attempt to reject potential psychoneurotics at the initial examination was abandoned in favour of observation and specialist examination during training. The 1922 committee's recommendation for early specialist treatment within the divisional area, or, for more serious cases, at special hospitals at the army base, to avoid evacuation to England, were equally well founded on medical evidence.

Dr. Ross's cases, and others of which I know personally, make it clear that the committee's recommendations for prophylaxis and treatment of psychological illness in the Army are not being implemented. If they had been many of the psychoneurotic soldiers who, in this present war, have already been evacuated to England would never have reached France in the first place, and, in the second place, having fallen sick, would not have reached the general hospitals in England.—I am, etc.,

London, N.W.3, Dec. 4. G. RONALD HARGREAVES.

Genito-urinary Injuries in War

SIR,—Will you allow me a belated comment on Mr. G. E. Neligan's valuable article on injuries to the genito-urinary tract, recently republished in *War Wounds and Air Raid Casualties*. As certain chapters of this book are likely to be used as a textbook by many young surgeons without previous war experience the advice given must be very exact.

First may I stress the importance of Mr. Neligan's advice that suprapubic drainage, with an indwelling de Pezzer or Malecot catheter, be provided for all wounds of the bladder and urethra, and also (at least under field conditions) for all cases of paraplegia. The prophylactic value of this simple procedure is as great as that of colostomy or caecostomy for wounds of the rectum and colon, and should never in any circumstances be omitted.

Secondly, I venture to question Mr. Neligan's statement that partial amputation of the penis may be necessary in cases of severe laceration. The question of whether the urethra is or is not reparable is of course entirely irrelevant. All that matters is that one of the arteries should be intact. I have seen several cases of very severe penile laceration heal well, leaving an organ diminished in size and tied up with scar tissue, but still capable of erection and inviting plastic repair. The best treatment is certainly immediate and careful repair, to the extent to which this may be possible. But even if the surgeon in the casualty clearing station should feel that to attempt repair is hopeless, I would suggest that he should never go further than to trim the wound, ensure haemostasis, suture the skin so far as he can with nothing coarser than horsehair, wrap the organ, or what remains of it, in dry gauze (if completely sutured) or in cod-liver oil gauze (if the wound is wholly or partly open; if cod-liver oil, which is antiseptic, is not available, then in vaseline gauze), and splint the organ in the upright position, at right angles to the abdominal wall, to provide elevation and immobilization. This can be done with two pieces of pliable wire such as is used for a Böhler finger splint. One piece is bent as for a finger splint, well padded, and the penis fixed to it with strapping. The other forms an arch padded at each end and secured to the skin just above each inguinal ligament with strapping, and to which the penile splint is tied. The arch is then itself tied to a cradle placed over the patient. Suprapubic drainage of the bladder is of course provided, and the patient can be sent straight on to a plastic surgeon at the base.

There is, at the worst, nothing to be lost by such conservatism. The blood supply to the penis is such that it will survive as astonishingly as does the scalp. One need not be a psychologist to realize what it means to a man to retain the possibility of a normal sexual life.—I am obliged to sign myself

A FORMER SURGEON TO THE INTERNATIONAL BRIGADES.

Anaesthesia in War Time

SIR,—In your issue of November 25 (p. 1057) Dr. Priestman expresses a wish that all who teach anaesthetics should put certain "N.B.s." The first one interested me very much: "Remember the significance of and difference between conjunctival and corneal reflexes." Surely the day is long past when anaesthetists take either of these reflexes. Sticking fingers into patients' eyes seems to me to savour of barbarism. In the *Journal* many years ago a paper was written by an ophthalmic surgeon who said: "The man who takes the corneal reflex shows the hall-mark of an incompetent anaesthetist." I have never seen that statement challenged.

I teach my students that all patients are blind; therefore there are no corneal reflex to obtain and no eyes to damage. The corneal and conjunctival reflexes are very superficial at the best, and I do not think surgeons would be overjoyed at having to operate in the presence of either of these. The eye is much too delicate a structure to use for anaesthetic signs, and with present-day premedication it is of very little value as a sign. During anaesthesia the eye should be kept covered and carefully guarded from outside irritation, such as ether vapour, bright light, and corneal attacks by anaesthetists. The most common cause of the condition known as "anaesthetic eye" is corneal damage by irritation and not, as formerly supposed, by ether or chloroform being spilled into it.—I am, etc.,

J. B. H. HOLROYD, D.A.,
Anaesthetist, Sheffield Royal Infirmary; Instructor in Anaesthetics, Sheffield University.

Sheffield, Nov. 25.

SIR,—Your leading article on anaesthesia in war time (*Journal*, November 11, p. 958) stimulates me to send one more contribution on this important subject. It is one which specially concerns the general practitioner, and for the past ten years I have been trying to improve my technique with, I believe, some success. As you rightly say, ether will be the anaesthetic most commonly used, but though relatively safe it has various drawbacks, which I have tried, within the limits of general practice, to eliminate.

I think that anyone who has used morphine and atropine before anaesthesia cannot deny the benefit they confer, but unfortunately their use completely upsets the action of the pupil so that its size can no longer be used as a reliable guide to the depth of anaesthesia, as it could before morphine and atropine were used. With the inexperienced anaesthetist the depth of anaesthesia is the thing he is most bothered about, and nervousness on this point is perhaps the greatest cause of poor administration. Basal anaesthesia is also a great comfort to the patient, but to those not accustomed to it it adds other complications, and, furthermore, the technique of administration is not always possible in war conditions.

Just about the time that avertin was becoming popular, but before it was safe enough to be used in cottage hospitals, I stumbled on a combination of drugs which proved to give me practically all the advantages that avertin offered, together with relief from the two difficulties mentioned above. I have since used it, sometimes as surgeon and more often as anaesthetist, in over 300 major operations of various types in persons varying from 18 to 85 years of age, and although the dosage may seem heavy it has proved remarkably safe. About an hour before the operation the patient receives a subcutaneous injection of morphine hydrobromide 1/4 grain, hyoscine hydrobromide 1/100 grain, and atropine hydrobromide 1/200 grain (Tab. Hyoscinae Co., P. D. and Co.) and an intragluteal injection of somnifaine 2 c.cm. The latter has had a chequered career as an anaesthetic which I need not detail, but it has the valuable property that it is slightly mydriatic, with the result that the combined action of these drugs is found to leave the pupil practically normal, so that the size of the pupil proves once again a useful guide to the depth of the chloroform or ether anaesthesia. The amount of ether required is about half that which would be required without the addition of somnifaine, post-anaesthetic vomiting is greatly

reduced, and amnesia is complete in about 90 per cent. of cases and usually continues for about twenty-four hours. There is a long post-anaesthetic sleep, usually about six hours, and though to some this may seem dangerous it has not proved so in practice, and it has the great advantage for war work that the useful time during which this combination works for anaesthesia is from three-quarters of an hour to three hours after administration, the ideal being between one and one and a half hours after. Where operations cannot be timed to the minute this is a considerable advantage for a basal anaesthetic. Actually it is my usual practice shortly after the patient has begun to recover from the anaesthetic, and been made comfortable from the nursing point of view, to give another 1/4 grain of morphine if he is at all restless, and this usually suffices for eighteen to twenty-four hours. The next night I follow this with a tablet of dial, which seems to act better than the other barbiturates on this night, unless there is much pain, in which case more morphine may be required, or a tablet of veramon with the dial. Occasionally two sonalgin tablets will succeed very well. With this scheme of dosage it is usually found that about three weeks after the operation the patient will have no clear memory, or complete amnesia, of the events of the first three or four days after the anaesthetic, and in the stress and horror of war work this ought to go a long way in reducing the number of psychological casualties among the injured.

One unexpected virtue of this combination is that under it the patient is noticeably free from shock. Pulling on the peritoneum and removal of a large organ or tumour, which in the ordinary way would be liable to cause marked shock under the anaesthetic, with this technique seem to affect the patient very little. This is not to excuse rough surgery, but it does help the anaesthetist by diminishing the trouble which an inexpert surgeon can cause him, and as the anaesthetic is a rather slow-moving one there is little chance of the patient suddenly collapsing or coming round at an awkward moment, and this diminishes the trouble an inexpert anaesthetist can cause the surgeon. There is usually a slight fall of blood pressure, 10 to 20 mm. Hg. but, as I say, shock seems much less than normal. However, should an analeptic be required there is none which, in my experience, can compare with cardiazol-ephedrine when this technique has been employed. I might add that the more I use oxygen the more am I pleased with its results, though it is by no means essential.

There remain the undoubted facts that post-operative shock is more marked after chloroform and ether than after nitrous oxide, etc., and also that both ether and chloroform are protoplasmic poisons which act specially deleteriously on the liver. This also has engaged my attention, and, though my observations are purely clinical and the deductions pure hypothesis, I believe that I have found out something of real help here too. When working with injections of concentrated solutions of vitamins A and D (now known as dekadexolin) I noticed that post-operative shock—as distinct from the shock during anaesthesia mentioned above—was practically absent if an injection of dekadexolin was given at the time of the operation. This observation has been so constantly repeated during the past eight years that I think it is indisputable. It has led me to suppose that some at least of the shock and poisoning action of the volatile anaesthetics is due to the fact that they are both powerful fat solvents and so, *a priori*, liable to interfere with the proper functioning of the fat-soluble vitamins stored in the liver. Whether this is so or not there is no doubt that when these patients are followed back into the wards they remain clinically in a much better condition than those who have not been so treated, and it is very rarely that any of them require even a rectal saline. Where relatively untrained nurses may have to be employed this also is a considerable advantage.

I am well aware that such a bald outline as can be given in a letter lays me and my methods open to many criticisms, but I also know that valid criticism can only come after a personal trial, which I trust that any would-be critics will hasten to make. After the experiment I believe that they will agree with me that, where conditions are not ideal or skilled team work is impossible, these three easily administered injections do in fact procure for patient, surgeon, and anaesthetist an ease and safety in ether anaesthesia unattainable by any other method. And with this it has advantages for war surgery which I have tried briefly to indicate.—I am, etc.,

Winsford, Cheshire, Nov. 23. W. N. LEAK, M.D.

Gas Injuries to the Eye

SIR,—I have been very interested in the letters which have appeared in the *Journal* on the subject of gas injuries to the eye, and note the comments of Colonel L. T. Poole and Professor J. H. Burn. I have had a fair amount of experience of these cases and have tried every therapeutic measure available. For more than two years I have confined my treatment to cod-liver oil and liquid paraffin. No other therapeutic measure has given a satisfactory result. Contact glasses may even do harm, as two of my cases have had the cornea perforated by this means. Colonel Poole, in his letter of November 25, stresses the instantaneous action of mustard gas, and when one notes this point it will be seen that the first-aid treatment is the same as the later treatment. Atropine will relieve the photophobia, but cod-liver oil is the essential. Dr. N. Pines mentions protein shock, but my own experience shows that this is useless, and also, be it noted, should be supplanted in the treatment of gonococcal ophthalmia by M & B 693.—I am, etc.,

Wolverhampton, Nov. 25. H. CAMPBELL ORR.

Blood Group Distribution in England

SIR,—As a consequence of the present emergency the blood group of a large number of persons has been determined in this laboratory. The distribution among the first 5,000 is recorded here. In every case the blood was taken from the finger into 3.8 per cent. citrate solution and tested with anti-A and anti-B sera of a titre not less than 128. Lately we have used serum supplied by the Medical Research Council through the Galton Laboratory Serum Unit, Cambridge, which we have found to be excellent. The tube method described by Thomas and Hewitt (*J. ment. Sci.*, 1939, **85**, 667) was used, except that the reactions were read by eye after two hours at room temperature and that the tubes were put up in specially designed racks of twenty-five rows. From a preliminary series of parallel tests we came to the conclusion that this method was superior to all others from the points of view of speed, accuracy, and convenience, and that it is the only one suitable for mass grouping. Naked-eye reading was made necessary by the large number of tests which were set up at one time, and which on occasion ran into many hundreds. All the tests were made by one or more of a team of three people, and it is with possibly pardonable pride that we can record the taking of 134 blood samples in twelve minutes. The rate at which the tests can be set up depends upon individual experience, but 300 an hour is not excessive for one person.

The observed proportions among this sample were:

Group	O	A	B	AB	Total
f	2233	2162	444	161	5000
p	0.44660	0.43240	0.08880	0.03220	1.00000
σ_p	± 0.00703	0.00700	0.00402	0.00249	

The gene frequencies calculated from this data and corrected for the initial observed value of D (Bernstein, O., *Z. Indukt. Abstamm. Vererb.*, 1930, **56**, 233) are:

$$p' = 0.26842$$
$$q' = 0.06248$$
$$r' = 0.66911$$
$$\overline{1.00001}$$

The observed values are in good agreement with the theoretical sum of unity ($D' = 0.00001$). The D/σ_D test gives $\sigma_D = 0.000025$ and $D/\sigma_D = 0.4$, so that the statistical fit for the series is also excellent.

This and our subsequent data will be fully treated in a future publication. The present figures have been communicated to the Galton Laboratory Serum Unit in response to the appeal of Professor Fisher and Dr. Taylor for inclusion in their national data.—I am, etc.,

JOHN C. THOMAS,
Major R.A.M.C.

Military Hospital, Shenley, Herts, Nov. 23.

Bipp

SIR,—While the times are surgically quiet I should like to draw the attention of all who are connected with war surgery to a paste which was used with marked success during the war of 1914–18, the so-called bipp. I saw this used myself with unfailing regularity and almost never-failing success. One of the leading consultant Army surgeons during that war gave to me the opinion that of all the antiseptics used at home or in France none had so great a value.

The process, briefly, is: (1) a clean dissection of the damaged and infected tissues; (2) a liberal smearing or filling up with bipp. The wound granulates from below upwards and needs no further dressing, thus saving an immense amount of pain and nursing labour.

We must learn from the lessons of the past; a substance whose value proved so remarkable after four years of unprecedented surgical experience must come again into the field of operative surgery. For the sake of those who would put to the test this pain-saving invention I submit the formula given to me; the formula in which 25 per cent. paraffin was used as a basis was not so successful.

Bismuth subgallate	4 ounces
Iodoform	8 „
Liquid glucose .. .. or q.s.	3¼ „
Balsam of Peru	4 drachms

Fiat pasta.

I trust that this method of dealing with wounds will be given a thorough trial during this war.—I am, etc.,

Folkestone, Nov. 27. AUSTIN PRIESTMAN.

Injection Treatment of Hernia

SIR,—Mr. A. Simpson-Smith (*Journal*, November 18, p. 990) remarks that the difficulties of injection treatment of inguinal hernia have compelled many surgeons to give up this procedure. That in skilled hands it can be entirely satisfactory I have had ample confirmation. I have seen many cases treated by Surgeon Commander St. G. B. D. Gray, R.N.V.R. (now on active service). The results were excellent. There is no doubt in my mind which form of treatment I would plump for if I had a hernia.—I am, etc.,

London, W.1, Nov. 28. A. ERNEST SAWDAY.

Treatment of Varicose Ulcers

SIR,—Being in charge of a very large varicose vein and ulcer clinic I was naturally interested in the letter from Dr. J. R. A. Davies appearing in your issue of November 25 (p. 1060). I should like to make the following comments.

In my experience true varicose ulcers are seldom multiple and are never associated with deep abscesses that need opening. Dr. Davies (in the one case he describes) attributes the spread of the *Staph. aureus* infection (to parts of the body remote from the legs) to "the damming-up of foul stinking septic discharges." After a careful study of his report it would appear that there is nothing upon which one could base his assertion of the spread of the infection from the legs to other parts of the body; it would appear at least equally probable that the boils and abscesses broke out everywhere (axillae, groins, and legs) as a manifestation of the one general infection, and that it was this infection that caused the temperature and general illness and not the occlusive dressings.

In such a case as is described Dr. Davies obviously adopted the correct treatment. I do, however, most seriously join issue with him when he condemns the modern miraculously successful treatment of varicose ulceration (by the tight binding up of the whole foot, ulcer, and leg with elastic adhesive bandages) merely because this treatment had been applied unsuccessfully to one isolated case which, on the face of it, was not one of true varicose ulceration, but one of multiple body abscesses, including the legs.

Every ulcer seen on a leg is not necessarily varicose. A Wassermann is often helpful (even in real varicose ulceration); and, when indicated, concomitant anti-syphilitic treatment is instituted. Even, however, in cases of syphilitic ulcers the elastoplast treatment is a valuable adjuvant. At my own clinic the tight "occlusive" bandaging up of ulcerated legs leads to regular cure. Large ulcers can be "expedited" by the placing over them of pieces of specially prepared sponge rubber. It is frequently our practice first of all to put cod-liver oil into the ulcer cavity under the sponge rubber. In other cases, if there be much purulent discharge, the ulcer is first filled with calomel powder or T.C.P. powder.

I write this "answer" to Dr. Davies in no sense of carping criticism, but merely because one cannot allow to pass unchallenged destructive criticism of a treatment that has brought rapid cure of untold pain and suffering to countless thousands throughout this country. After all, this "occlusive" tight bandaging treatment is on the same lines as the most successful "occlusive" method of treating compound fractures by the Winnett-Orr method.—I am, etc.,

Liverpool, 1, Nov. 30. STUART MCAUSLAND, M.D.

Virtues of Brown Bread

SIR,—A very few years ago a letter advocating whole-meal bread would have provoked a lively and somewhat acrid discussion on the respective merits of white and whole-meal. This is no longer the case. Professor Geoffrey Taylor's letter (November 18, p. 1022) has so far been allowed to pass without comment. Your own annotation of August 5 (p. 289) was a masterly presentation of the large mass of experimental evidence that you had accumulated, proving the great superiority of whole-meal over white judged by every criterion. Your exposition aroused no response whatever apart from my own letter, which you were good enough to publish on August 19 (p. 426). The reason must, I think, be that the superiority of whole-meal is no longer in dispute. Why then are we still a white-bread-eating nation? And why do thousands of medical men themselves eat white bread although they know it to be inferior to whole-meal?

The remedy I suggested in my letter was for all medical men (*a*) to advise their patients to eat whole-meal bread, and (*b*) to insist on being supplied with whole-meal for their own use. Professor Geoffrey Taylor's suggestion is that the British Medical Association should urge the Government to legislate to encourage, if not to compel, the universal eating of whole-meal instead of white bread. This would be an ideal plan, but it might take some time to mature; meanwhile I would plead with the medical profession to adopt my suggestion, which, of course, is an obvious and not a new one.—I am, etc.,

London, W.1, Nov. 25. ALFRED C. JORDAN.

SIR,—With all the prominence given to food and its rationing it is surprising that so little attention has been accorded to brown bread in the dietary. It is an important source of the accessory food principle vitamin B_1, so advantageous for the healthy functioning of nervous and unstriped muscle tissue, while for many persons it has an actual relish not obtaining in white bread.

In Italy since the beginning of totalitarianism brown bread is compulsorily supplied by the bakeries, for it is recognized there that not only is the quality enhanced but the quantity is also increased—seven loaves in place of six for the same quantity of grain. In England a "colour prejudice" is apparently extended to food, especially among the poor and uninformed.—I am, etc.,

Netley, Nov. 26. ARTHUR KING.

Oestrogens: Natural and Synthetic

SIR,—Your statement in the *Journal* of November 25 (p. 1048) that no differences have been observed between the actions of the natural oestrogenic hormones and the synthetic product (stilboestrol) fails to take into account the recently published findings of two Dutch workers (Duyvené de Wit, J. J., and Bretschneider, L. H., *Klin. Wschr.*, 1939, 18, 1423),

who describe an absolute qualitative difference in the actions of the natural and synthetic oestrogens. They found that while oestradiol, oestrone, and oestriol were definitely active in the Bitterling test, stilboestrol caused no reaction in doses one hundred times those of the natural oestrogens.

Quantitative differences are, of course, numerous.—I am, etc.,

Horsham, Nov. 25. N. HOWARD JONES.

A Testicular Tumour

SIR,—In view of the rarity of tumours of the testicle and of their apparent association with the undescended organ, I send you the following account of a case which you may like to record.

An African patient aged about 40 was admitted to hospital recently under my care. He had a history of a lump coming and going in the region of the left inguinal ring, for an unknown but considerable length of time; recently this had been increasing in size and becoming painful, and had remained at the external ring. On examination the lump resembled a hen's egg sitting on the external ring; it felt rubbery and was painful; there was only one testicle in the scrotum. At operation, kindly performed for me in my absence by Dr. Billington, there was degenerating grumous material in the centre of the mass, which appeared to be the testicle undergoing malignant change. The tumour was removed locally, as a more extensive operation did not seem justifiable. But the wound has already broken down and oedema of the scrotum and feet has developed.

The pathologist's report is as follows: Dense stroma and epithelial cells and lymphoid tissues in haphazard arrangement; congestion and some inflammatory reaction. The condition appears to be a teratoid tumour of an undescended testicle. It contains some rapidly proliferating cells and is probably malignant.

With regard to the frequency of testicular tumours in England, I find that the majority of figures approximate to that of 0.06 per cent. from an investigation of a series of 110,000 male cases admitted to a general hospital. Of this series, 16 per cent. are recorded as occurring in the undescended testicle (other series show 11 per cent. and 12 per cent.). I regret I cannot find strictly comparable figures for the incidence of undescended testicle, but it is recorded that 0.45 per cent. of a series of 2,000 public schoolboys had this abnormality. If these two sets of figures were comparable it would suggest that 2 per cent. of undescended testicles become malignant. I have no significant figures for the incidence of these conditions in this country, but I have seen nothing to suggest that they would be very different from those in England.—I am, etc.,

R. B. LEECH, M.B., B.Ch.Cantab.

Mengo Hospital, Kampala,
Uganda, Oct. 6.

Sigmund Freud

SIR,—Having just returned to my desk from a prolonged summer stay, I find your issue of September 30, 1939, awaiting me. I have read with much interest the obituary notice of Sigmund Freud and am presuming to compliment you upon its accuracy, its completeness, and, above all, its understanding. The *British Medical Journal* has for many years stood high in my estimation for its outstanding service to medicine and the medical profession. This fair-minded and sympathetic obituary has served to increase my admiration for the many high qualities of the *British Medical Journal*.

Freud himself tells us he spent but six months with Charcot and not a year as stated, but this slight error is of little significance. Furthermore, also of minimal importance, was not his contact with Breuer earlier than 1884? Also "cancer" should read "sarcoma" if one wished to be exact pathologically, but as the distinction is not known to many physicians the broad term "cancer" will suffice.—I am, etc.,

New York, Nov. 16. SMITH ELY JELLIFFE.

Obituary

SIR WILLIAM PROUT, K.C.M.G., M.B.

Lieutenant-Colonel Sir William Prout, K.C.M.G., late Colonial Medical Service, died at the Manor House, Lingfield, Surrey, on November 18, aged 77. He was born in 1862, the son of William Prout of Mauritius, and educated at Edinburgh, where he graduated as M.B. and C.M. in 1884. He entered the Colonial Service in 1885 as assistant poor law medical officer in Mauritius, but in 1888 was transferred to West Africa, where he spent the rest of his service, first as assistant colonial surgeon of the Gold Coast; in 1895 he was appointed colonial surgeon of Sierra Leone, medical officer of health of Freetown, and Official Member of the Legislative Council, with the rank of principal surgeon, which he held till his retirement in 1906 after thirty years' service. He then settled in Liverpool, where he was a lecturer in the Liverpool School of Tropical Medicine, and in 1912 was appointed medical officer to the Colonial Office. During the war of 1914–18 he served in Egypt as a lieutenant-colonel in the R.A.M.C., and was twice mentioned in dispatches. After the war, in 1919 he was appointed senior medical officer to the Colonial Office and in 1927 senior consulting physician for that office, resigning in 1929. He was made C.M.G. in 1905, O.B.E. in 1919, knighted in 1924, and created K.C.M.G. in 1928. He had been a member of the British Medical Association since 1898; at the Annual Meeting in 1910 he was honorary secretary, and in 1912 vice-president, of the Section of Tropical Diseases. In 1888 he married Mary, daughter of John Mackenzie of Montrose, and had one son and one daughter; the son was killed in the war of 1914–18.

NAUGHTON DUNN

Mr. T. P. McMurray writes:

The death of Naughton Dunn at the early age of 54 years has deprived the British Orthopaedic Association of its president, a post he had held during 1938 and 1939. His association with orthopaedic surgery began before the last war, when he became house-surgeon to the late Sir Robert Jones in the year 1911. His holding of this post was the beginning of an unbroken association and friendship between the two men, which lasted until Sir Robert's death. Leaving Liverpool in 1913, he became connected with the problem of the cripple in Birmingham and district when he was appointed surgeon to the Birmingham Cripples Union, the forerunner of the present Royal Cripples Hospital in Birmingham. In 1915 the formation of military orthopaedic centres was found to be necessary, and Robert Jones, who had been given complete charge of its organization, called on Dunn as one of the few men who were adequately trained to carry out the work. Dunn's work during the strenuous war period was magnificent, and earned for him a great reputation among his colleagues and assistants. Returning to Birmingham after the war, he continued his work at the Royal Cripples Hospital and at the Robert Jones and Agnes Hunt Orthopaedic Hospital at Oswestry, an institution in which he played a particularly vital part. His reputation was world-wide as a sound progressive orthopaedic surgeon who had added much to our knowledge, particularly in regard to the surgery of deformities of the feet. He received many honours, but of them all probably the one he treasured most was the honorary LL.D. which was conferred upon him by his own University of Aberdeen. He was connected with many hospitals in the Midlands, both in an active and in an advisory capacity, and held the very important post of lecturer in orthopaedic surgery to the University of Birmingham.

WILFRED TROTTER

Dr. C. Wynn Wirgman writes:

In your noble tribute to Wilfred Trotter his friends and pupils will feel that justice has been done to one who was certainly among the great men of the age. None ever sought counsel of him but they felt that he spoke as one of the oracles of God. I was intimately associated with him for years, and I cannot remember an occasion or opinion where he was at fault. No doubt he was wrong sometimes, but personally I never found him so. All knowledge seemed his province, and his teaching to those who were fortunate enough to sit at his feet was complete and final. His opinion on a medical case was as reliable as that on a surgical one. Simplicity, modesty, and altruism were the keynotes of his character. His loss makes the world poorer and adds a name to the list of the world's great dead.

"G. H. S." writes:

Your biographer has rightly stressed Mr. Wilfred Trotter's awe-inspiring mental calibre, which was liable to produce an oaf-complex in his disciples if it did not already exist, and has relegated his operative skill to second place. But what was secondary in him was as the brightness of Sirius in relation to his contemporary surgical "stars." Of how many others could it be said, as was true of him, that it was a perfect joy to watch him remove a simple appendix: the knife handled as Vermeer must have wielded his brush, the needle with the finesse of an embroidress, and above all the surpassing gentleness of manipulation? Alas, that we so rarely encounter such a complete surgical artist, in the best sense of both words, in whom an outstanding intellect is happily wedded to true art, but so frequently find surgeons possessing these qualities in the single state.

With the death of BENJAMIN SUMNER, M.D., M.Ch., on November 3, at his residence in Warren Road, Blundellsands, at the age of 76 years, Liverpool and its northern suburbs have lost one of their best known and highly esteemed practitioners, who had been a member of the British Medical Association for fifty-three years. Dr. Sumner studied medicine at the Liverpool Royal Infirmary and University College, London, qualifying in 1885. During his studentship he was awarded the Lyon-Jones Scholarship at the Liverpool Royal Infirmary. In 1889 he was appointed honorary physician to the Bootle General Hospital (then the Bootle Borough Hospital). Having interested himself in gynaecology, which was becoming a special subject, he was in 1908 appointed honorary gynaecological surgeon to the hospital, resigning the post of honorary physician. He remained gynaecologist to the hospital until he retired from the active staff in 1923, when he was appointed consulting gynaecological surgeon. For many years Dr. Sumner had been vice-president and also vice-chairman of the general committee of his old hospital. "W. R. R." writes: By Dr. Sumner's death his fellow practitioners, and especially his younger colleagues, have lost a great friend who was only too glad to help them with his knowledge, gained from his vast experience. His familiar figure riding his pet horse will be greatly missed by the residents of Crosby. He died in harness as was his wish, having done his usual work up to three days before the end, though owing to a serious cardiac lesion work during the last few months must have required great endurance.

DR. FREDERICK RICHARD BRUCKS ATKINSON, who died suddenly in London on November 18 in his 73rd year, was educated at King's School, Canterbury, and Edinburgh University, where he graduated M.B., C.M. in 1891 and proceeded to the M.D. in 1896. After two years at sea as ship surgeon he took up the work of a general practitioner first at Dulwich and then at Chertsey, but he early devoted himself to the study of tuberculosis. On the establishment of the national health insurance scheme he was appointed tuberculosis medical officer by the Middlesex County Council and spent the rest of his working life in this post. In his leisure time Dr. Atkinson translated for the New Sydenham Society Sternberg's monograph on acromegaly and other foreign medical works, and himself wrote a book on acromegaly which appeared in 1932.

DR. WILLIAM CECIL WHITESIDE of Fazeley died on November 18 at the age of 69 years. He was a son of the Rev. Stephen Whiteside, vicar of Shap, Westmorland. A student at Trinity College, Dublin, and at the University and Royal College of Surgeons, Edinburgh, he obtained the degrees of M.B., Ch.B.Ed. in 1909. In 1912 he went as assistant to Dr. Thomas Buxton at Fazeley, and on the latter's death in 1916 succeeded to the practice. He also took over the appointments of medical officer and public vaccinator for the Fazeley district and Wilnecote and Middleton, which he held until his retirement from the profession just over a year ago. For many years he had been honorary surgeon to the Wilnecote Division of the St. John Ambulance Brigade, a movement in which he was keenly interested. Dr. Whiteside is survived by his widow and one daughter.

DR. G. T. ECCLES died at Worthing on November 25 aged 73. He studied medicine at Cambridge and St. Bartholomew's Hospital, and graduated B.A. in 1887, M.B., B.Ch. in 1892, and M.A. in 1918. Before taking up practice at Hove he had been house-surgeon and house-physician at the West London Hospital and assistant medical officer in the electrical department at St. Bartholomew's. "J. H. C." writes: Dr. George Tolcher Eccles practised in Hove and was the borough police surgeon for nearly forty years, and his memory will long be kept alive in the town by the very many kindnesses he did for so many people. His generosity was only one of his many excellencies. He had a dominant personality, and in any gathering he was outstanding. He was one of a medical family, and he was himself typical of his generation of trusted family doctors. Of late years his chief interest was in fly-fishing. He was also a prominent Freemason and president of the Devonian Society in Brighton and Hove for three successive years.

DR. HAROLD EVERETT PACE died at his home in Goring-by-Sea, Worthing, on November 26 at the age of 71. Six years ago he retired from general practice in Leyton, E.10, where he had practised for over a generation. A Londoner by birth, Dr. Pace studied medicine at the London Hospital, qualifying in 1893. He held posts at "the London" as house-surgeon and house-physician, and took his M.B. degree in 1897. He served as civil surgeon with the African Field Force during the South African War. Apart from that his whole career was spent in general practice in Leyton, where his familiar figure was known to two generations of Leytonians. "D. S." writes: Dr. Pace was one of the finest types of men to be found in the profession, much liked and trusted by his patients and highly esteemed by his fellow practitioners. He was district medical officer to the Essex County Council and public vaccinator. He retired from practice on reaching the age limit and went to live at West Worthing. During the great war his house in Leyton was completely destroyed by a Zeppelin bomb, and it was marvellous how any of the family escaped alive. A few years ago he lost a son in the Royal Air Force. Dr. Pace bore these trials bravely, but there is no doubt they adversely affected his health. He leaves a widow and a son and daughter. He had been a member of the British Medical Association for twenty-four years.

The death is announced of DR. EDMUND HERBERT CORDER of Worcester, aged 76. He was educated at Queen's College, Birmingham, and qualified in 1886 as L.R.C.P., L.R.C.S.Ed. and L.R.F.P.S.Glas. After holding the post of resident surgical assistant at the Queen's Hospital, Birmingham, Dr. Corder began practice at Worcester, and for over twenty-seven years was poor law medical officer for No. 2 District; he was also appointed honorary surgeon to the Worcester Dispensary and for a time acted as anaesthetist at the Worcester General Infirmary. He was a most popular medical officer and had a large private practice. For six years he served on the city council and during the last war devoted much time to the

local medical board. He retired from active work about four years ago because of failing health. Dr. Corder first joined the British Medical Association in 1887.

The following well-known foreign medical men have died: Dr. HEINRICH NEUMANN, formerly professor of oto-rhino-laryngology in Vienna, in New York, aged 66; Dr. D. G. STIEFLER, extraordinary professor of neurology at Innsbruck, aged 62; Dr. AUGUSTE PETTIT, professor at the Pasteur Institute of Paris, member of the Academy of Medicine, and author of works on anti-poliomyelitis serum and spirochaetosis icterohaemorrhagica, aged 70; and Dr. CARL GUSTAF SANTESSON, emeritus professor at the Karolinska Institute, Stockholm, and editor of *Skandinavisches Archiv für Physiologie*, aged 77.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Faculty Board of Medicine gives notice that as from October 1, 1939, it has withdrawn approval of courses in pharmacology held at institutions outside Cambridge, but students who on October 1, 1939, had gone out of residence without attending the course in Cambridge may make application to the secretary of the Faculty Board for leave to attend courses given elsewhere.

UNIVERSITY OF WALES

WELSH NATIONAL SCHOOL OF MEDICINE

The following candidates for the degrees of M.B., B.Ch. have satisfied the examiners in the examinations indicated.

PATHOLOGY AND BACTERIOLOGY.—J. D. P. David, A. A. Edwards, W. M. Jones, J. Lewis, Monica Parry-Morton, D. K. W. Picken, K. M. Wheeler, J. Williams, O. Williams, G. A. Wright.

OBSTETRICS AND GYNAECOLOGY.—*Beryl Badham, T. C. H. Davies, D. I. Harries, Marguerite J. Hennelly, D. D. Howell, O. Howell, G. A. Jones, Anne N. M. Llewhelin, J. E. Lloyd, R. M. Marshall, D. G. Morris, H. V. Roberts, Glenys J. Wade.

PHARMACOLOGY.—J. D. P. David, Sadie M. Davies, *N. E. France, W. S. Hill, E. H. Horton, Margaret W. Hughes, Morfudd E. Humphreys, R. T. James, E. R. Jones, D. K. W. Picken, Erica M. G. H. Roberts, Huw D. Walters, O. Williams.

SURGERY.—H. R. Hudd, M. Lewis, Mair Llewelyn, Silvia M. D. Mehta, D. G. Morris, R. E. Packer, J. L. Rees.

* With distinction.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—J. B. Gurney-Smith, A. M. McCall, M. F. Smith, K. Talboys.

MEDICINE.—G. O. C. Davies-Webb, R. M. J. Franks, E. A. Griffiths, W. C. Heunis, J. N. Hunt, J. A. Sutton.

FORENSIC MEDICINE.—G. O. C. Davies-Webb, R. M. J. Franks, E. A. Griffiths, W. C. Heunis, J. N. Hunt, J. A. Sutton.

MIDWIFERY.—C. E. S. Myers, J. P. Rochford.

The diploma of the Society has been granted to W. C. Heunis and J. A. Sutton.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At the annual meeting of the Royal College of Physicians of Edinburgh, held on November 30, Dr. Alexander Goodall was re-elected President, and the following were elected to form the Council for the ensuing year: Dr. Edwin Bramwell, Dr. Charles McNeil, Dr. A. Fergus Hewat, Dr. D. M. Lyon, Dr. W. D. D. Small, and Dr. A. Graham Ritchie. Dr. McNeil was nominated Vice-President.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow held on December 4, with Dr. J. Souttar McKendrick, President, in the chair, the following were admitted Fellows of Faculty: James Paton Orr Erskine, M.B., Ch.B. (Glasgow), Alexander Slessor, M.B., Ch.B. (Motherwell).

Medico-Legal

DISSOCIATED PERSONALITY

The tragic case in which Dr. L. P. Lockhart was found guilty of the murder of his wife but insane[1] showed very clearly the application of established legal principles to a somewhat unusual set of facts. The doctor had been badly shocked in the last war, and there was plenty of evidence of his emotional instability before the act. He was proved to have written a notice, "Keep out, gas (study). Fetch police," to have given his wife an injection of sodium evipan, to have placed her and himself on the floor by a gas fire, and to have turned on the gas. The defence sought to prove that he had done these things unconsciously in a condition in which his personality was suppressed and the automatic powers of the body took charge. Serjeant A. M. Sullivan, K.C., pointed out that this was not an insanity defence but that, as the doctor had committed the act during unconsciousness, he should simply be found not guilty. Eminent psychiatrists agreed that the facts, if true, showed a genuine state of dissociation, and that in such a state a series of highly complicated and apparently rational acts could be performed automatically and not remembered.

In order to set up an insanity defence it is necessary to prove that the accused person, owing to mental disorder, either did not know what he was doing or did not know that it was wrong. If, however, a person kills another in a state of unconsciousness the obvious inference is that he was labouring under mental disorder. In his summing-up the learned judge indicated some disagreement with the suggestion that Dr. Lockhart really was quite unconscious of his acts, but said there was evidence on which the jury could find that he had been insane and not responsible for them; the jury found this evidence convincing. Even if the unconsciousness had been proved beyond any doubt, it was manifestly due to disorder of the mind; the unfortunate patient was shown to be a danger to himself and others; and it was necessary in his interests as well as those of the community that he should come under the care of the State and be suitably treated. Incidentally, it is interesting and encouraging to observe the progress the courts are making in their recognition of dissociated states in which the offender is not responsible for his actions and is hardly, if at all, conscious of them. They do not yet, however, recognize the state, sometimes called "irresistible impulse," in which the action is just as dissociated and automatic but the offender is conscious of it and of its illegality. Nor does the law of England permit a verdict of "Not guilty on the ground of insanity," preferring the illogical formula "Guilty but insane." One of His Majesty's judges a short time ago directed the jury in a similar case that they might find the accused guilty of the act charged but by reason of disease of the mind not responsible at law. Such a formula is more merciful as well as more logical. Moreover, those who desire to see a verdict of "not guilty" follow a successful insanity defence must remember that no legislation is likely to take away the prerogative right of the Crown to take care of an insane person who has committed a crime until he can safely be allowed to re-enter the community.

[1] *British Medical Journal*, November 25, p. 1063.

"*Surgical Addiction.*"—In an excellent paper is described the unfortunately familiar type of patient whose psychological state becomes successively worse with each of the many operations which he or she has successfully induced surgeons to perform. The phrase "surgical addiction" indicates the psychological homology between this and other types of addiction.—Surgical Addiction: Case Illustration. P. Greenacre. —*Psychosomatic Med.*, April, 1939, **1**, 325.

The Services

DEATHS IN THE SERVICES

Colonel HENRY HALCRO JOHNSTON, C.B., C.B.E., late R.A.M.C., died on October 18, aged 83. He was born at Orphir House, Orkney, on September 13, 1856, the fifth son of James Johnston, eleventh Laird of Coubister, Orkney, and was educated at Dollar Academy, at the long-defunct Collegiate School of Edinburgh, and at the University of Edinburgh, where he graduated M.B., C.M. in 1880. He proceeded M.D. in 1893 and in the same year took the B.Sc., proceeding D.Sc. (Public Health) in 1894. He entered the army as surgeon on July 30, 1881, attained the rank of colonel on February 16, 1911, and retired on September 13, 1913. In his young days he was a noted rugby footballer, having played as full-back for Scotland against both Ireland and England in 1877. He did not again receive an international cap, but for three years he played as a forward in the Edinburgh University fifteen. He had a fine list of war service: Sudan, 1885, at Suakin, medal with clasp and Khedive's Star; North-West Frontier of India, 1897-8, in charge of British No. 1 Field Hospital, operations in the Malakand, in Bajaur, in the Mahmund country, and in Buner, including the action at Laudakai and the attack and capture of the Tanga Pass, mentioned in dispatches, April 22, 1898, medal with clasp; South Africa, 1899-1902, operations in Natal, mentioned in dispatches, February 2, 1901, and July 29, 1902, Queen's medal with clasp and King's medal with two clasps, and the C.B. After retirement he rejoined for service in the war of 1914-18, when he served as Assistant Director of Medical Services at Glasgow and at York, and as Deputy Director of Medical Services at Gibraltar, and received the C.B.E. He was the author of numerous contributions to scientific journals. After retirement he settled at Orphir, in his native island of Orkney, where he was a deputy lieutenant of the county. He was unmarried.

The Bibby liner *Yorkshire* was torpedoed and sunk by a German submarine with much loss of life. She had on board a total of 278, of whom 160 were ship's complement, the remainder passengers, chiefly officers and soldiers with their families on the way home from the East. The company reports that 33 passengers were missing, chiefly women and children. Among those lost was Lieutenant-Colonel WILLIAM LEONARD ELIOT REYNOLDS, M.C., R.A.M.C. He was born on April 4, 1889, was educated at Guy's Hospital, and took the M.R.C.S., L.R.C.P. in 1915. He at once entered the Royal Army Medical Corps, Special Reserve, as a temporary lieutenant, took a commission as lieutenant and temporary captain on January 1, 1917, became captain on August 1, 1918, and major on February 2, 1927, and was promoted to lieutenant-colonel in August this year. He served throughout the war of 1914-18, in which he gained the Military Cross. He had been a member of the British Medical Association since 1927. He was Deputy Assistant Director-General, Army Medical Services, War Office.

Lieutenant-Colonel CHARLES HENRY STRATON, R.A.M.C. (ret.), died at Exmouth on November 1, aged 63. He was born on May 16, 1876, was educated at St. Mary's Hospital, and took the M.R.C.S., L.R.C.P. in 1898, and subsequently the D.P.H. of the Colleges in 1911. After serving as house-surgeon at St. Mary's Hospital and clinical assistant at the Great Ormond Street Hospital for Sick Children and at the Central London Ophthalmic Hospital, he entered the Royal Army Medical Corps as lieutenant on April 25, 1900, became lieutenant-colonel on December 26, 1917, and retired on August 20, 1921. He served throughout the war of 1914-18, chiefly in the Mediterranean, where he acted as Assistant Director of Medical Services in Egypt. He received the Order of St. Sava of Serbia (4th Class), as well as the war medals. After his retirement he settled in Devonshire, where he was school medical inspector to the Devon County Council at Honiton. He was a member of the British Medical Association for thirty-eight years.

Lieutenant-Colonel GEORGE FOWLER, Indian Medical Service (retired), died suddenly at Keynsham, near Bristol, on November 13, aged 65. He was born on April 29, 1874, and educated at Madras and Charing Cross Hospitals. He took the Scottish triple qualification in 1895, after gaining the L.M.S.Madras in 1894. He also took the D.P.H. of the London Colleges in 1899, and the D.T.M.Lond. and D.T.M. and H.Cantab. in 1908. Entering the I.M.S. as lieutenant on June 27, 1901, he became lieutenant-colonel on December 27, 1920, and retired on April 29, 1929. He was appointed a Civil Surgeon in the Central Provinces in May 1914, but reverted to military employ during the war from January, 1915, to October, 1919. He had been a member of the British Medical Association for thirty-eight years.

Major GEORGE BAILLIE, R.A.M.C. (ret.), died suddenly at West Runton on October 26, aged 66. He was born on March 1, 1873, the youngest son of the late Dean Baillie of Letterkenny, Co. Donegal, and was educated at Trinity College, Dublin, where he graduated M.B., B.Ch., B.A.O. in 1900. He entered the Army as lieutenant in the Royal Army Medical Corps on January 21, 1900, became major on June 21, 1912, and retired on August 1, 1920. He served in the war of 1914-18.

Major PIERCE MORGAN BRETT, R.A.M.C. (ret.), died at Salisbury on November 26, aged 54. He was born on May 23, 1885, was educated in Ireland, and graduated M.B., B.Ch., B.A.O. of the Royal University of Ireland in 1909. He entered the Royal Army Medical Corps as lieutenant on January 27, 1911, became major on November 25, 1927, and retired immediately afterwards but continued to be employed at Salisbury in the Reserve of Officers after retirement. He joined the British Medical Association in 1926 and served as honorary secretary of the Salisbury Division in 1936-8. He leaves a widow.

Medical Notes in Parliament

In the House of Commons on December 5, during the debate on the address, Dr. ELLIOT said that he had that morning received from Lord Nuffield the offer of a million ordinary share units of Morris Motors Limited, equivalent to perhaps £1¼ million, as the nucleus of a central fund for the co-ordination of hospital finance and policy in the provinces, which he had accepted forthwith (see p. 1148).

The debate on the address continued during the week and was largely concerned with supplies for the fighting Services. In the House of Lords Lord Halifax spoke on British war aims.

The Postponement of Enactments (Miscellaneous Provisions) Bill was down for second reading in the House of Commons on December 6. It proposes to postpone the operation of the House-to-house Collections Act to a date to be fixed by Order in Council.

Hospital Accommodation in Scotland

In the House of Commons on November 21 a discussion took place on hospital problems in Scotland. Colonel COLVILLE said that they had secured some 12,000 beds in existing hospitals for the treatment of casualties, and this number could be increased at short notice to 14,500. Adaptation of mental hospitals and three large hotels should give them, in a few months, some 5,100 additional beds, and hutted hospitals and annexes now being built 10,000 more. In all the programme would give them some 31,000 beds. The needs of the ordinary sick and of military cases were not being overlooked. Hospitals included in the scheme were expected to admit all persons who might fairly be said to be in urgent need of institutional treatment. Arrangements were being made under which the additional hospital accommodation would be available for the ordinary sick if they could not obtain treatment elsewhere. He was issuing a small brochure on the hospital services which would give the information in some detail.

Army personnel in urgent need of institutional treatment were admitted to hospitals in the Emergency Service in the same way as civilian patients. Arrangements had also been made at the request of the Deputy Director of Medical Services, Scottish Command, whereby accommodation was being made available for 500 Army sick who required light hospital treatment which could not be afforded in hospitals controlled by the military authorities. The patients were being admitted, in

the main, to base hospitals on the understanding that they would be evacuated as rapidly as possible if the hospital beds were required for the purposes of the Emergency Service. An extension of this arrangement, to cover some several hundred additional patients, was under consideration.

First-aid Posts

On November 21 Sir JOHN ANDERSON, in reply to Mr. Denville, said that the attention of public authorities had already been drawn to the importance of providing direction boards to first-aid posts, but he was informed by Dr. Elliot that it was not generally considered necessary to provide direction boards to hospitals; ambulance drivers learnt the routes as part of their training. The police had already been in consultation with the hospital authorities about traffic arrangements with a view to securing that ambulances should arrive and depart in the shortest possible time.

On November 21 Dr. ELLIOT told Mr. Denville that he was not aware that at certain aid posts the access to those parts set aside for the decontamination of gas casualties was so restricted by sandbags that a stretcher case could not be admitted, but he would look into any case of which Mr. Denville forwarded particulars.

Dr. ELLIOT also informed Mr. Denville that supplies of the antiseptic called azochloramid had already been distributed so as to be available at first-aid posts.

Medical Board Examinations

In reply to Dr. Howitt on November 23, Mr. ERNEST BROWN said his information did not confirm a statement by the former that many men passed fit by medical boards had soon been found to be unfit for service. He was carefully examining the position. Dr. HOWITT asked Mr. Brown to ensure that all such mistakes were at once reported to the medical board which passed the man as fit so as to prevent recurrence of such mistakes. Mr. BROWN replied that he would consider this suggestion. A few cases had been brought to his notice, and in these he had always arranged for a re-examination.

Dr. HOWITT asked whether it would be possible for the boards to have power to refer doubtful cases to specialists before the men were passed. Mr. BROWN stated that he was examining suggestions of the kind. Each medical board consisted of a chairman and four other medical men.

Women in Industry and Infant Mortality

Mr. DAVID ADAMS asked Sir John Anderson on November 30 whether, in view of the severe increase in infantile mortality during the last war, special observations were being made for the protection of the health of women in industry; and in what circumstances the Government's permission must be sought with regard to the working of overtime by women, and upon what principle this permission was granted. Sir JOHN ANDERSON recalled that the War Cabinet Committee on Women in Industry reported in 1919 that the influence of employment upon the infant mortality rate was not altogether clear, but observed that the rates were low in 1916 and 1917, when a continually increasing number of married women were being employed. He said that special observation would be kept, in consultation with the Industrial Health Research Board, on the working conditions of women and others in factories during the present war. As regards women's hours of work, the hours authorized, while varying according to circumstances, were far shorter than those which were commonly worked in the last war. They were being kept under review.

Social Services to be Expanded

In the House of Commons on December 5 Dr. ELLIOT said that when we were planning for a three-years war and spending at the rate of £2,400,000,000 a year in the process we still contemplated some expansion in our social services. The money invested in these had provided an excellent return. We had now a lower infant mortality and a lower maternal mortality than Germany. Before the outbreak of war the national service of midwives set up by the Midwives Act, 1936, was settling down to full-time work. The first steps had been taken to set up the comprehensive arrangements for the treatment of cancer, for which provision was made in the Cancer Act. Over 4,000,000 houses had been built since the last war and we had entered upon the fifth million. The President of the Board of Education and he hoped shortly to complete arrangements for a far greater concentration of medical effort on the school children than ever before. The process which had added inches in height and nearly a stone in weight to school children was still going on. During the war the aim must be to keep in working order this vast machine, improving it from time to time as conditions permitted. He hoped it would be possible to complete the bulk of the houses started by local authorities before the war, to complete all those which were being built for factory workers and agricultural workers, and, subject to the financial position, eventually to enable local authorities and private enterprise to build new houses for such workers.

Payment of Medical Boards

On December 5 Mr. GROVES asked the Minister of Labour and National Service what fees were payable to members of civilian medical boards for the examination of recruits, having regard to the notification to doctors by the British Medical Association confirming the appointment containing the statement that an appropriate fee, to be settled in consultation with the Association, would be paid for each session. Mr. ERNEST BROWN replied that members of medical boards were paid at the rate of two guineas a session for the first five sessions in a week, and 1½ guineas for any subsequent sessions in the week, an additional half-guinea being paid to the chairman. These rates applied uniformly to all medical boards.

Functions and Inspection of First-aid Posts

On December 5 Mr. GROVES asked the Minister of Health how he reconciled the instructions that the seriously injured were to be taken direct to hospitals and not to first-aid posts with the terms of E.M.S. Memorandum No. 4 issued by his Department. Dr. ELLIOT said that although the first-aid posts were intended primarily for the lightly injured it was recognized that some of the more serious cases might require early treatment at first-aid posts in certain circumstances—for example, if the nearest casualty receiving hospital was much further away than the first-aid post and the patient appeared to require immediate treatment. This was indicated in the opening paragraph of E.M.S. Memorandum No. 4.

Dr. ELLIOT also informed Mr. Groves on December 5 that the medical officers of his Department who inspected first-aid posts were specially experienced in the organization of casualty services. In making their inspections they adopted such procedure as in their judgment was best suited to the circumstances of the area. Any changes or adjustments were normally settled by them on the spot, in agreement with the medical officers of health, who were assisted by the medical officers appointed to each post; but if necessary they were the subject of communications between the responsible local authority and himself.

Central Medical War Committee

On December 5 Mr. GROVES asked the Minister of Health whether the Central Medical War Committee was the same as the Central Emergency Committee of the British Medical Association, having regard to the answer on November 16 and the statements made in the British Medical Association circular D.17/1939–40. Dr. ELLIOT said that the Central Emergency Committee assumed the functions of the Central Medical War Committee shortly after the outbreak of war.

Equipment at First-aid Posts.—Mr. GROVES asserted on November 30 that the official equipment of first-aid posts contained no provision for the accommodation of recumbent cases, whether adults or children. Dr. ELLIOT replied that stretcher cases would normally be taken to hospitals and not to first-aid posts. Adequate provision was made under the official scheme for recumbent cases at

first-aid posts by stretchers and blankets issued to each scheme-making authority and by trestles which could be purchased out of the furniture allowance of £15 per post

Medical Officers for A.R.P.—Dr. ELLIOT told Mr. Groves on November 30 that he would not be justified in advising local authorities that medical officers of an age which made them likely to be called upon for military service and without practical experience of war wounds should not be employed as deputy medical officers of health for air raid precautions purposes or placed in charge of first-aid posts. Local authorities, guided by the advice of their medical officers of health, were employing suitable medical officers in these services.

Approved Societies' Additional Benefit.—Dr. ELLIOT states that some modification of the normal procedure for dealing with approved societies' schemes of additional benefits has been made in the present exceptional circumstances with the object of saving work on the part of societies and of the seriously depleted staffs of the Department and the Government Actuary. Under the new procedure a suitable scheme of benefits, so far as possible identical with that at present in force, is recommended to the society for adoption. If any society desires to submit alternative proposals consideration is always given to any representations which they may make. This procedure does not differ in any material respect from that adopted by the Department of Health for Scotland.

Notes in Brief

No women doctors are serving in the Women's Auxiliary Air Force, but the appointment of a limited number of women doctors primarily for duty with that Force is receiving consideration.

In a statement on November 22 about the British troops in France Mr. HORE-BELISHA said their health was exceptionally good, the sickness rate being lower than the peace-time rate at home.

Medical News

In September last it was decided, in consequence of the war, to postpone the Chadwick Public Lectures which were to have been delivered this autumn. The Trustees have now resolved to resume the lectures, if national conditions permit. The first lecture is to be delivered on Tuesday, December 12, at 2.30 p.m., at the Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, W.1, when Sir William Savage, M.D., will discuss "The Health Aspects of Canned Foods." Admission is free.

As Patron of St. Bartholomew's Hospital the King has accepted a specially bound copy of *Rose Window*, the book published by Heinemann's in aid of St. Bartholomew's Hospital. As President of the Hospital His Royal Highness the Duke of Gloucester has accepted a similar copy, and has expressed the hope that the volume will bring in a good sum. The book (illustrated by Anna Zinkeisen) consists of twenty-five hitherto unpublished contributions by famous authors. It costs 7s. 6d.

The 1939 Nobel Prize for Chemistry has been divided between Professor A. Butenandt, director of the Kaiser-Wilhelm Institute for Biochemistry, Berlin, for his work on sex hormones, and Professor L. Ruzicka, of the University of Technology, Zurich, for his work on polymetylenes and higher terpene compounds. The reserved 1938 Prize for Chemistry has been awarded to Professor R. Kuhn, Heidelberg, director of the Kaiser-Wilhelm Institute for Medical Research, for his work on carotinoids and vitamins. The Nobel Foundation has decided not to hold the usual festivities in connexion with the distribution of the prizes this year.

The secretary of the London Lock Hospital informs us that the out-patient departments for both sexes at Dean Street remain open as usual, and the Lock should therefore have been included in the list of London hospitals out-patient departments appearing last week at page 1105. The out-patient department of the Metropolitan Ear, Nose, and Throat Hospital (Fitzroy Square, W.) is now open every weekday from 10 a.m. to 11.30 a.m.

The name of the National Baby Week Council is now changed to National Baby *Welfare* Council, this name being more commensurate with the increased scope of work falling to the Council's lot under war conditions. The address of the National Baby Welfare Council is 29, Gordon Square, London, W.C.1.

On October 24 a meeting was held at the St. Louis Medical Society in honour of Dr. William Washington Graves, professor of neuropsychiatry, St. Louis University School of Medicine, and Dr. Graves was awarded a certificate of merit and a gold medal for scientific accomplishment for his classification of scapulae and other inherited characters, and for his discovery of "the age-incidence principle of investigation." The St. Louis Medical Society has given this certificate of merit for scientific accomplishment on two previous occasions: in 1927 to Dr. Evarts A. Graham and his associates, Drs. Glover H. Copher, Warren H. Cole, and Sherwood Moore, for their work in cholecystography; and in 1935 to Dr. Edward A. Doisy for his achievements in hormone chemistry and physiology.

Professor R. T. Leiper, Professor H. S. Raper, and Professor W. W. C. Topley have been elected members of the Council of the Royal Society for the ensuing year.

Dr. A. Douglas Cowburn retired on November 18 from the post of H.M. Coroner for the Southern District of the County of London.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The rise in the prevalence of diphtheria and scarlet fever in England and Wales referred to last week has not been maintained. The increase in pneumonia (influenzal and primary) continues, but the extent is negligible, and deaths from influenza are well below last week's figure, although they exceed that of the corresponding week of last year. There has been a tendency for the incidence of cerebrospinal fever to increase in the last few weeks, but in no locality have the numbers recorded amounted to more than minor outbreaks. The total 37 cases recorded in England and Wales were distributed over as many as seventeen administrative counties, and in only three were there more than 3 cases—namely, Denbigh 6 (all in Wrexham M.B.); Glamorgan 5 (Rhondda 2, Caerphilly, Cardiff C.B., Merthyr Tydfil, 1 each); Lancaster 5 (Swinton and Pendlebury 3, Liverpool 1, Rochdale 1). Acute poliomyelitis has fallen to less than one-third of last year's level. Among the twelve counties involved Somerset only had more than a single case: 1 each in the rural districts of Wincanton and Yeovil. The urban districts were more frequently affected than rural districts.

Notifications of both measles and whooping-cough show an increase of more than 50 per cent. over those recorded last week. In all probability some part of the increase is attributed to more complete notification. In some localities measles has already attained epidemic proportions. For instance, of 414 cases in Glamorgan 214 were in Caerphilly and 101 in Rhondda U.D.; of 166 cases in the West Riding of Yorks 95 were in Thorne R.D. and 26 in Skipton R.D., compared with 5 in Sheffield. Other striking examples of unusual prevalence in certain areas are: Cumberland 105 (33 in Ennerdale); Warwick 119 (81 in Leamington); Gloucester 68 (29 in Cheltenham). On the other hand, there were only 2 cases in Leicester County (none in Leicester itself), 6 in Middlesex, and 13 in London. In six counties in England and four in Wales no case of measles was recorded during the week—namely, Berks, Isle of Ely, Norfolk, Soke of Peterborough, Rutland, West Suffolk, Carmarthen, Montgomery, Pembroke, and Radnor. It is evident that the expected measles epidemic is beginning in rural and urban areas rather than in the large towns, to which it will doubtless spread in the next month or so. How far this is due to the abnormal distribution of non-immunes consequent upon evacuation and how far it is a natural phenomenon cannot be determined with certainty as comparable figures for previous epidemics are not available.

No. 46

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended November 18, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	37	1	10	7	1	15	3	10	3	2
Deaths		—	1				—	1		
Diphtheria	963	29	227	53	45	1,530	160	288	86	35
Deaths	29	1	2	3	2	22	3	2	5	1
Dysentery	46	1	39		—	42	11	18		—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	1	—	—	1	—	5	—	—	—	—
Deaths		3	—				1	—		
Enteric (typhoid and paratyphoid) fever	22	—	5	3	1	31	11	8	5	2
Deaths	1	—	—	1	—	3	2	—	—	—
Erysipelas			72	6	9			73	8	7
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	31	3	7	8	1	40	8	7	4	3
Measles	1,830	13	18		28		23	22		2
Deaths	1	—	—	—	—	—	—	—	—	—
Ophthalmia neonatorum	81	4	21		—	69	6	28		—
Deaths										
Pneumonia, influenzal*	637	46	8	4	19	723	104	15	5	17
Deaths (from influenza)	31	8	3	1	—	21	1	3	2	3
Pneumonia, primary			139	5				392	11	
Deaths		9		8	9		1		8	11
Polio-encephalitis, acute	1	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	13	1	—	—	—	45	5	6	2	1
Deaths		—	—				—	—		
Puerperal fever	—	—	11	1	—	7	7	22	4	—
Deaths		1†					1†			
Puerperal pyrexia	174	6	28		4	180	15	21		1
Deaths										
Relapsing fever	—	—		—	—	—	—		—	—
Deaths										
Scarlet fever	1,359	34	240	68	96	2,072	179	396	48	100
Deaths	1	—	1	—	1	1	1	1	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,334	35	25		7		160	293		17
Deaths	3	1	2	—	—	8	3	2	2	2
Deaths (0-1 year)	270	39	55	29	16	294	41	87	16	14
Infant mortality rate (per 1,000 live births)						49	34			
Deaths (excluding stillbirths)	4,494	715	612	185	121	4,274	805	603	210	134
Annual death rate (per 1,000 persons living)			12.4	12.4	10.6	10.5	10.3	12.3	14.2	11.9
Live births	5,485	664	757	286	222	6,388	1,208	844	351	204
Annual rate per 1,000 persons living			15.3	19.2	19.5	15.7	15.4	17.2	23.8	18.1
Stillbirths	235	35	41			273	30			
Rate per 1,000 total births (including stillborn)						41	24			

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
† Death from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Income Tax

Change in Employment

"M. T." ceased his employment in 1938–9 and accepted another appointment for 1939–40 at a higher salary. On what basis should he be assessed?

*** The correct legal basis is that adopted by the inspector of taxes—that is, to regard the first source of income as having ceased and consequently the present employment as a new one, carrying the liability to assessment for the first year on the actual earnings of that year. We understand, however, that where the two employments are substantially similar and continuous the authorities are willing to disregard the change and continue to apply the previous year's basis. If the income of 1939–40 should fall short of the anticipated (and therefore the assessed) amount redress can be obtained before the second instalment of tax falls due for payment next July. Another reply in this issue covers "M. T.'s" question with regard to expenses; in any case private removal expenses are not allowable.

War Work—Travelling Expenses

"M.," a retired practitioner, receives 30s. a day for full-time work at a military reception centre. He has to motor eleven miles a day between home and the centre, and also has to incur mess expenses. What can he deduct?

*** The remuneration is chargeable under Schedule E, and the relative rules as judicially interpreted do not permit the deduction of such expenses. Consequently we have to advise "M." that he has no claim.

LETTERS, NOTES, ETC.

Economy in the Kitchen

THE FOOD EDUCATION SOCIETY, 29, Gordon Square, London, W.C.1, has published a leaflet, prepared at the instance of the St. Pancras Council of Social Welfare, entitled "Help and Health for Housewives." The hints given are as follows:

Save your baker's bill by buying whole-meal bread. It is far more nourishing than white bread and you need less of it.

Save your stale bread. Cut it in thin slices and dry in a slow oven to make "scrunch," which children love. It is good for teeth and digestion.

Save your cabbage and other vegetable water. It is a splendid drink: a good medicine and a favourite with children. Use it also for soup and gravy.

Save time and money by cooking potatoes in their skins. This will give you the highest food value and the best flavour.

Save your butcher's bill by eating more herrings and cheese. Whole-meal bread, margarine, cheese, and apple make a perfect meal.

Save fuel and labour by sometimes giving children, instead of puddings, apples, oranges, dates, and figs, which contain natural sugar.

Save labour and firing by eating more raw salad, such as watercress, tomatoes, celery, finely chopped raw heart of cabbage, grated carrot, or onion, etc.

Save by spending less on vinegar, sauces, pickles, and salt. Good cooking is spoilt by these additions.

Save by avoiding ready-made food in packets. Why pay through the nose for breakfast cereals when whole-meal bread gives much better value?

Save by using the stewing-pot more and the frying-pan less. This saves fuel and is better for the digestion.

Save by chewing your food carefully and not drinking much at meals. Sip plenty of water on rising, in place of tea, and between meals. See that children get enough water to drink.

Save both health and tea bill by avoiding strong or stewed tea. It plays havoc with digestion, nerves, and sleep. Never give tea to children. Milk or milk and hot water is excellent.

We are asked to add that the leaflet may be had in quantities at reduced rates—50 for 2s. 6d., 100 for 4s. 6d., 1,000 for £2.

Administration of A.R.P. Casualty Services

"C." writes: Dr. H. Mainwaring Holt, in his letter in the *Journal* of November 18 (p. 1021), uses the phrase, "Mobile units sound very attractive." They are lavishly equipped and staffed. There is one objection, however (there are others), which should be stressed. This is delay—long delay—before they are in a position to deal with their patients. During a recent exercise the "all clear" signal was given at 5 p.m., and the mobile unit arrived on the scene at 5.55 p.m. Casualties may have occurred at a time considerably earlier than 5 p.m.; say, 4.30 p.m. Presumably the injured could not have been attended to at the earliest in much under half an hour. Allowing fifteen minutes for the return by ambulance to the A.R.P. first-aid station or hospital, it would appear that well over two hours elapse before casualties can reach surgical help of hospital standard. In my opinion the most sketchy first aid, if rendered within half an hour, is preferable to this.

Crataegus oxyacantha

Dr. A. E. SAWDAY (Crouch End Hill, N.8) writes: I am curious to know why Dr. Frank Bodman (*Journal*, November 18, p. 1022), who I understand is attached to a homoeopathic hospital, uses a dose of 1 to 5 minims of tincture of crataegus rather than a homoeopathic dose.

An International Congress Postponed

Professor H. BURGER, president, and Dr. A. MARRES, honorary secretary, write from Amsterdam: The committee of the fourth International Oto-rhino-laryngological Congress regret that they are obliged to give notice of their decision to postpone the congress for an indefinite time. Our first circular letter was ready to be forwarded in August to the 8,000 oto-rhino-laryngologists whose addresses were known. It contains the information that H.M. the Queen of the Netherlands had graciously accepted the patronage of the congress. Four Ministers, the Governor of the province of Noord-Holland, and the burgomaster of Amsterdam were to be honorary presidents; delegates of H.M. Government were to hold a reception for the congress in the Amsterdam National Gallery (Rijksmuseum), and the Netherlands Oto-rhino-laryngological Society invited all members to the closing banquet. We thankfully mention that for the three main subjects nine well-known colleagues had promised to deliver reports; besides over twenty oto-rhino-laryngologists from several countries had already announced papers. We hope that the present horror will give way to better times, and that at some future date it may be granted to us to send our invitation once more to the oto-rhino-laryngological world.

An Apology by "Picture Post" to Lord Horder

Lord HORDER writes: I shall be grateful if you will give space to the enclosed apology, which will appear in the next issue of a magazine called *Picture Post*. The paragraph is self-explanatory.

"Apology to Lord Horder

"A private photograph of Lord Horder was published in our issue of November 27 without his knowledge or consent. Lord Horder has further drawn our attention to the incorrect description of himself as 'the King's Physician' and as having acted as physician to the late King George V. We take this early opportunity of expressing our regret to Lord Horder for the inconvenience and annoyance that have been caused him."